AMERICAN GAS ASSOCIATION MONTHLY

Exhibit Space at 1934 Convention in Heavy Demand

Why Gas Is Superior For Large Volume Cooking

THOMAS J. GALLAGHER

Advertising Program of Hotel-Restaurant Committee

A. W. HUMM

Canadian Gas Industry Shows Improvement

GEORGE W. ALLEN

Measuring Meter Reading Time Requirements

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Hon. George B. Cortelyou Celebrates 25 Years as Gas Company President

April, 1934

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and

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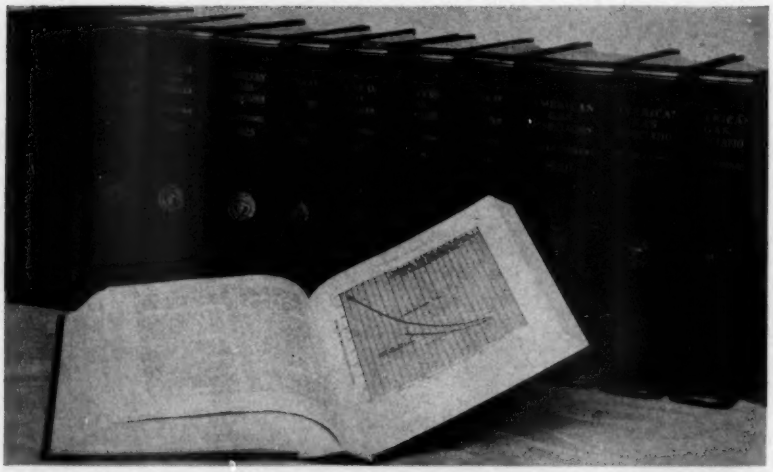

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As you are interested in gas you will want this important reference book—it will be a valuable addition to your library. This volume of a thousand pages covers the year's developments in the manufacture, sale and distribution of gas, and tells the story of improvements made in the appliance and equipment field.

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AMERICAN GAS ASSOCIATION
420 Lexington Avenue **New York, N. Y.**

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New Gas Ranges Combine Usefulness and Beauty

RECENT appliance testing activities at the A.G.A. Testing Laboratory, in Cleveland, Ohio, indicate definitely a general tendency on the part of gas range manufacturers to radically redesign their equipment in an attempt to achieve higher levels of usefulness and modernity in gas appliance construction. Although the manner in which individual manufacturers are pursuing this end varies considerably, the items below illustrate the general direction of their efforts.

One obvious trend in gas range design is toward modification of top burner forms and arrangements. Several manufacturers, for example, are now employing circular or specially shaped top burners made of cast iron or high quality die case metal, non-clog ports of the ribbon or slot type being used. Others, however, prefer to retain the conventional "star" type burner, but are extending and developing the use of aeration plates or bowls around burner heads. In many instances, the distance between the burner ports and the cooking surface of the top grate has been reduced and the design of the top grate itself altered. New forms of top burner lighters are also making an appearance. At every turn decided developmental changes are being introduced.

Nor is this movement toward ultimate modernity in range fabrication confined only to the top cooking sections. Oven doors, handles, manifold shields, legs, bases, top surface layouts, and the general architecture of appliances are all undergoing slow but sure transformation. Gas cocks differing radically from those of the conventional type are now appearing. Ingenious mechanisms and constructions are being applied to utility compartments, broiler racks, drawers and slides.

Ovens thermostats are more and more generally supplied as standard equipment and automatic oven ignition is frequently offered. In some instances, time clock control is furnished. In general, the element of convenience is being stressed, and the workmanship and appeal of domestic equipment is being accorded more than the usual degree of attention.

The newer models produced by practically every manufacturer reflect an ardent desire to keep abreast of modern times and well in advance of the constantly increasing demands of the world for finer home furnishings. As a result, the gas range is evolving from a conventional into a fashionable and more flexible piece of domestic equipment.

The zeal with which range manufacturers are revamping their products to suit the most exacting demands of the consumer, with respect to both beauty and fine engineering, is indicated in the number of new models at present undergoing test for approval at the Laboratory. The increase in the number of new models submitted for test is striking, particularly when present conditions are contrasted with the situation existing a year or even a few months ago. Such widespread intensity of interest in the design and construction of gas ranges, revealed through Laboratory operations, points significantly to the probability that the gas ranges of the near future will more than keep pace with coming national progress and recovery.

AMERICAN GAS ASSOCIATION MONTHLY

Allyn B. Tunis, Editor

VOLUME XVI | APRIL, 1934 | NUMBER 4

Exhibit Space At Atlantic City In Heavy Demand

HEAVY demands for exhibit space are pouring in upon Association Headquarters which indicates that our Sixteenth Annual Convention, to be held at the Municipal Auditorium, Atlantic City, N. J., the week of October 29, will have a display of gas appliances and equipment seldom if ever before equalled.

This will be the first exhibit held in connection with the Convention since 1931, and since that time remarkable advances have been made by manufacturers in developing and improving apparatus for domestic and industrial uses.

Eager to show their products, manufacturers literally have swamped Headquarters with applications for space. On March 19, manufacturer company members received from the Exhibit Committee details concerning participation in the forthcoming display.

The response was almost instantaneous. By March 24, according to C. W. Berghorn, director of Exhibits, prospective exhibitors' requirements had absorbed approximately 66 per cent of available space. Sixty-seven manufacturers, representing practically all lines of appliance and equipment production, had requested large and small quarters in which to show their wares.

With practically two-thirds of the space in the Atlantic City Auditorium already applied for, there is every indication that the remaining third will be disposed of in record time.

Manufacturers who have so far (March 24) applied for space are as follows:

Ruud Mfg. Co.
American Gas Products Corp.
General Ceramics Co.
Detroit-Michigan Stove Co.
American Stove Co.
Roper Corp., Geo. D.
Cribben & Sexton Co.
Moore Bros.
Wilcolator Co.
Cleveland Heater Co.
Patrol Valve Co.
Estate Stove Co.
Reynolds Gas Regulator Co.
Stacey Bros. Gas Const.
Roberts Brass Mfg. Co.
General Gas Light Co.
Safety Gas Main Stopper Co.
Dresser Mfg. Co., S. R.
Bryant Heater Co.
Dearborn Chemical Co.
Surface Combustion Corp.
Cutler-Hammer Inc.
Lavino & Co., E. J.
Alpha-Lux Co.
Milwaukee Gas Specialty Co.
United States Pipe & Foundry Co.
American Meter Co.
Lovekin Water Heater Co.
Sprague Meter Co.
American Gas Journal
Superior Meter Co.
Chaplin Fulton Mfg. Co.
Glenwood Range Co.
Gas Purifying Materials Co.
Mulcare Engineering Co.
Globe American Corp.
Sands Mfg. Co.
Clow & Sons Co., James B.
Handley Brown Heater Co.
Therminsul Corp. of America
United Engineers & Constructors
Minneapolis-Honeywell Regulator Co.
Burroughs Adding Machine Co.
Blodgett Co. Inc., G. S.
United American Bosch Co.
Wood & Co., R. D.
Tappan Stove Co.
National Tube Co.
Lattimer Stevens Co.
Cleveland Trencher Co.
Mueller Co.
Wood Mfg. Co., John
Floyd-Wells Co.
Robbins Publishing Co.

(Continued on page 142)

Honoring Geo. B. Cortelyou, President of the Consolidated Gas Company of New York, upon the completion of twenty-five years of continuous service with the company. Officers of the company in Mr. Cortelyou's office, Monday, March 26, 1934, from left to right: F. H. Nickerson, Vice-President; Oscar H. Fogg, Vice-President; Floyd L. Carlisle, Chairman of the Board; Mr. Cortelyou; W. Cullen Morris, Vice-President; John Stilwell, Vice-President; and H. M. Brundage, Vice-President

Mr. Cortelyou Celebrates Quarter Century Service With Consolidated Gas of N. Y.

HON. GEORGE B. CORTELYOU, first president of the American Gas Association, completed a quarter of a century of service with the Consolidated Gas Company of New York on March 26, and his friends and associates made it a day to be remembered. Many baskets of flowers reached his desk during the forenoon. He spent the day in receiving greetings and resolutions of company officers and organizations, but these happy affairs did not prevent him from presiding at company business meetings.

That night officers and trustees of the companies in the Consolidated Gas Company system tendered him a dinner at the Union Club.

Mr. Cortelyou joined the Consolidated Gas Company as president March 25, 1909, soon after he retired as Secretary of the Treasury in President Theodore Roosevelt's Cabinet. In completing twenty-five years of continuous service, he becomes eligible for membership in his company's Quarter Century Club.

He had a long and eventful career in Washington, being the only person to have served in three Cabinet positions. In 1891, he became private secretary to the Fourth Assistant Postmaster General. In November, 1895, he was transferred to the Executive Mansion as stenographer to President Cleveland, and three months later he was made executive clerk to the President.

In 1898 Mr. Cortelyou became an assistant secretary to President McKinley, and in 1900 he was appointed Secretary to the President.

Saw McKinley Shot

Mr. Cortelyou was with McKinley in Buffalo when the President was shot down by an assassin. Upon Mr. Cortelyou devolved general direction of the arrangements attending the illness, death, and burial of the President.

The anniversary of President McKinley's birth, January 29, is observed each year by Mr. Cortelyou, who sends to officers and department heads of the utility company a red carnation, President McKinley's favorite flower.

Mr. Cortelyou continued as Secretary to the President under Roosevelt until 1903, when he entered the Cabinet as the first Secretary of the newly created Department of Commerce and Labor. He organized the department and mapped out the lines along which it has since developed.

He resigned in June, 1904, to become Chairman of the National Republican Committee, carrying on the campaign which elected Roosevelt President.

Mr. Cortelyou entered the new Cabinet in March, 1905, as Postmaster General and served until March, 1907, when he became Secretary of the Treasury. He served until the end of the Roosevelt administration, including the panic period of 1907.

In 1918, Mr. Cortelyou became the first president of the American Gas Association, serving two terms. He was elected president of the National Electric Light Association in 1932, and

continued as president when this Association reorganized into the Edison Electric Institute. He has the distinction of being the only person to serve as president of these two large associations.

During the twenty-five years in which Mr. Cortelyou has been president of the Consolidated Gas Company of New York, it has grown from a company with 11,243 employees to a group of affiliated enterprises employing 45,840.

Mr. Cortelyou has always taken a keen interest in the employees of the company. Shortly after he became president, he spoke as follows to a meeting of the Mutual Aid Society:

"Because I happen to be President of the Company with which so many of you are associated, you must not think of me as sitting in my office away in another part of the town engrossed only in business details and leaving all that concerns you to work itself out. Indeed, I say to you frankly, that what concerns you concerns me vitally. I am deeply interested in everything that makes for your welfare, and I want you to know also that I regard consideration on our part for his or her welfare the right of every one of our employees."

"Handmaid of Opportunity"

One interesting incident in Mr. Cortelyou's Washington life which is not generally known occurred in January, 1899. A greatly perturbed New York banker, James Speyer, went to President McKinley to explain that the historic agreement between the Central Pacific Railroad and the United States Government for the settlement of the road's debts had been released both here and in Europe for publication the following day, but that the necessary signature of Attorney General Griggs was unobtainable as he was absent from Washington on a speech-making tour. President McKinley pressed a button. A young secretary entered.

"Get this to the Attorney General, wherever he is, and have him sign it today," commanded the President.

"Yes sir," replied the young man.

"But," interjected the banker, "how can I be sure that the Attorney General will have signed it before tomorrow morning?"

"Didn't you see me give it to Mr. Cortelyou?" asked the President, somewhat testily, as he dismissed the matter.

Mr. Cortelyou has often said that he secured his start in life through stenography, and he has at various times referred to stenography as the "handmaid of opportunity."

Mr. Cortelyou was born in New York City on July 26, 1862. After passing through the public schools, he attended Nazareth Hall Military Academy, at Nazareth, Pa. He graduated from the Hempstead, Long Island, Institute in 1879, and from the State Normal School, Westfield, Mass., in 1882.

He entered the New England Conservatory of Music at Boston, and also studied under Dr. Louis Maas, former conductor of the Philharmonic Society of Boston. He continued his study of music in New York during 1884 and 1885 and also attended Walworth's Stenographic Institute. He entered the government service in 1884 in the office of the Appraiser of the Port of New York. He was later a general law reporter, and the principal of a private school.

His association with the Post Office Department started in 1889 when he became private secretary to the post office inspector in charge at New York City. He was later a confidential stenographer to the surveyor of the Port of New York.

Mr. Cortelyou was married on September 15, 1888, to Lily Morris Hinds. Five children were born to them: George B. Cortelyou, Jr.; William Winthrop Cortelyou, Helen Cortelyou (deceased), Mrs. Jacob F. Weintz (Grace Cortelyou), and Peter Crolius Cortelyou.

A. G. A. Meritorious Service Medal Is Coveted Distinction

IN 1933, the American Gas Association, through the generosity of the late Walter R. Addicks, who, at the time of his death, in 1931, was vice-president of the Consolidated Gas Company of New York, set up an award to be made annually to the individual adjudged to have performed the most meritorious service to the industry.

This award is in the form of a gold medal, beautifully designed, and is one of the most coveted honors within the gift of the Association. It is given only for the most meritorious act during a twelve-month period, and, to date, only seven men have had it bestowed upon them. They are:

1924—Patrick Augustine Gubbins, Consolidated Gas Co. of New York.

1925—Timothy Dwyer, Cambridge Gas Light Company, Cambridge, Mass.

1926—Henry F. Ketz, Southern Counties Gas Company, Santa Barbara, Calif.

1927—Harry Lang, Northern Union Gas Company, New York, N. Y.

1928—No award.

1929—No award.

1930—Jesse Adams Harvey, The Empire Gas & Electric Company, Geneva, N. Y.

1931—Frank E. Steinhardt, Consolidated Gas Company of New York. Posthumous award.

1932—William Earl Tracy, Kansas City Gas Company, Kansas City, Mo.

1933—No award.

The American Gas Association Meritorious Service Medal is available to employees of all manufactured and natural gas company and manufacturer company members. The next presentation, it is expected, will take place at the Sixteenth Annual Convention and Exhibition of the Association, at Atlantic City, during the week of October 29. It will recognize some deed performed during the period from July 1, 1933, and June 30, 1934.

Acts for which the Meritorious Service Medal is awarded include meritorious and conspicuous judgment, intelligence, or bravery in saving life, either in the plant or works of any gas undertaking or having to do with the handling of materials of manufacture or of the products manufactured or distributed. Any loyal citizen, without regard to age, sex, race, religion or political affiliation is eligible for this award. Names of persons deemed eligible for consideration should be forwarded to the Association.

Applications must be filed with the Association Headquarters, 420 Lexington Avenue, New York, N. Y., before August 1, 1934. Application forms and further information regarding the Medal may be had upon request to Headquarters.

Advertising Program Of Hotel and Restaurant Committee

By A. W. Humm

Manager, Gas Merchandising Division, Williams & Saylor, Inc.

THE Hotel and Restaurant Committee of the Industrial Gas Section has prepared an advertising and merchandising plan that promises to become one of the most important activities sponsored by the American Gas Association in recent years.

It is a plan that every gas company can use in its efforts to safeguard and expand their commercial cooking load. It provides a background of aggressive promotion by gas companies that will give manufacturers an active industry-wide sales drive to support and justify increased advertising activity on their part. It will gather increasing momentum as the benefits derived from modernizing become generally known to hotel and restaurant operators.

A brief review of the history of the commercial cooking load and conditions that threaten its future is necessary here to establish the soundness of the merchandising plan and the advertising as the logical and obvious approach to the complicated problem facing the industry.

The commercial cooking load is a desirable and profitable load. It has grown steadily for years with very little organized competition from other industries. Up until recent years it had been taken almost for granted that new customers who would do wholesale cooking would use gas, and those who were using it would not change.

Its universal acceptance by the hotel and restaurant industry as the ideal fuel, and its widespread use because of its desirable qualities, had been considered an effective check on competition. All competition had been able to offer was lower fuel cost, a factor completely overwhelmed by the speed, cleanliness, dependability and labor-saving features of gas.

However, conditions have changed in the hotel and restaurant field. Business has fallen off. Costs have not come down in proportion. In the struggle to stay in business hotels and restaurants are studying these costs to make every economy possible. Their fuel costs are being investigated with the idea of utilizing, if possible, cheaper fuels than gas.

In many cases the gas installations in use are anything but efficient, and have too much equipment for the job. The result is larger gas bills than business justifies and an exaggerated idea of the cost of gas for fuel.

Competition has been quick to grasp the opportunity offered by these conditions. Realizing that such an attitude of mind is helpful to their cause they —particularly the oil interests—have come into the field with aggressive sales campaigns. Extravagant claims are made for lower costs obtainable with their fuel. They are extending most liberal terms in allowing equipment to be paid for out of savings, and are waging sales promotion campaigns in this field which the gas industry cannot afford to ignore.

Conditions Show Improvement

As a result of these aggressive efforts, gas has been replaced in enough instances to create a condition worth serious consideration. Each case that replaces gas is given national publicity. Oil salesmen use these cases as sales ammunition on the gullible hotel and restaurant men. While the total number of gas replacements may not appear large in comparison with the large number of gas kitchens, the effect of this competition should not be judged alone upon this result.

It is a fact that the hotel and restaurant industries have had no money to spend for equipment and are limping along as best they can. There is no way of telling how many are being sold the idea of replacing gas with oil when they have the money to spend. While this competition may not be aggravating to many gas companies now, it will be when oil jobs go in and the local dealers have something to point to in support of their claims.

Now conditions are improving. Repeal has given many hotels and restaurants a new lease on life. A taste of prosperity has put them in the mood to spend money to make money. They are rapidly being convinced that spending money on their kitchens will save money. It is the gas industry's job to convince them that spending this money on new gas equipment is the safest, surest, most satisfactory way of securing lower cooking costs, and that such an expenditure will prove an investment with guaranteed returns in the form of savings that can be determined in advance.

Let's take the case of oil competition. It is the most widely advertised and the most aggressively promoted of low cost fuels. It is making its big drive on gas kitchens equipped with old-fashioned gas appliances—for there lies its big market.

The oil salesman claims as much as 60 per cent savings on the gas bills. This statement, together with many other exaggerations, cannot be substantiated. His strongest claim to recognition is cost, and he pounds away persistently and consistently at this argument.

In company with electricity, he claims less shrinkage. Here again he is misleading. He claims fast operation, but oil ranges by their very nature require time to reach a cooking temperature. He claims that his equipment will give everything that gas will give, plus lower cooking costs.

Let us contrast all this with the story that modern gas service can tell the hotel or restaurant man.

Oil can only take care of a small part of the cooking need—the ranges. These generally account for about 40 per cent to 45 per cent of his gas bill. Therefore savings, if any, can only be made on part of the kitchen.

Modern gas service can show economies in every cooking operation. Insulated heat-control ranges can cut his

Your gas company offers

A NEW WAY TO CUT COSTS

Special cooking-cost survey, made without obligation, uncovers many ways to make savings, while actually improving service

NO OTHER FUEL has ever cooked so well, so comfortably, at so little cost as gas. And recent research has found many new ways to bring gas cooking costs even lower.

Your gas company knows these new economies thoroughly It now offers you its knowledge, at absolutely no obligation, in a special cooking-cost survey service.

Lift your 'phone—now—and ask for this free check-up. Let your gas company send you a cost engineer who knows every new wrinkle for saving with gas. He knows exactly where other well-managed kitchens have recently cut costs.

You, too, can cook better than ever with gas today—at less cost than ever. Let your gas company show you how.

FOR INSTANCE: *Odds are long that your urns, steam tables, rinse tanks could all be costing you less this very minute. This survey will tell you how*

modern GAS *service*

cooks it better—for less

HOTEL AND RESTAURANT COMMITTEE OF THE

AMERICAN GAS ASSOCIATION

First of a series of advertisements in the hotel and restaurant field as it will appear in the May issues of the "American Restaurant," "Hotel Management," "Restaurant Management"

roasting costs. Insulated heat-control ovens can cut his baking costs. Thermostatic conversion of urns and steam tables can cut his coffee and warming costs. Gas toasters can cut his toasting costs. As we go down the line, we become more and more convinced that our real competition is not coal or oil, but the obsolete, inefficient gas equipment now in use. Without question, kitchen modernization is the Industrial Section's major sales problem and great sales opportunity for 1934.

Economies Shown

The records of almost every gas company show cases such as the following, where definite economies have followed kitchen modernization.

Parker House, Boston, shows a fuel saving in excess of 25 per cent.

Rosoff's Restaurant, New York City, saves 25 per cent. Kitchen temperature reduced 15° to 20°.

Hotel Savoy, Kansas City, six months' comparison of gas bills shows a saving of 49.3 per cent.

Essex County Hospital, Cedar Grove, N. J., 27.7 per cent in fuel, or better than $200 per month.

University Club, Los Angeles, auditor reports savings of 40 per cent.

These cases, picked at random from various sections of the country, show that no area is particularly favored by conditions or rates that make these savings isolated ones.

Hundreds of other cases equally as impressive are available to show that modern gas equipment can meet oil in its strongest argument—cost—and give vastly better service from every operating standpoint.

Modernized gas kitchens leave no argument for competitive fuels. The oil man's claims are answered. The electric argument becomes ineffective because modern gas service is a superior service and beyond comparison in speed and economy.

Granting that kitchen modernization offers the industry a great sales opportunity, how can the story be presented in a short quick-action advertising campaign?

Kitchen modernization is a broad technical subject that involves fuel as well as equipment. This big, broad subject must be boiled down to a simple, understandable story that can be easily grasped and acted upon by the busy hotel and restaurant man. It must carry the story of modern gas service to thousands of hotel men facing the need for lower costs and cause those about to purchase oil or coal ranges to reconsider. It must bring the gas man and kitchen operator together for a discussion of his cooking problem.

Common-Sense Approach

The advertisements planned as part of this sales drive will bring this complicated story down to a few simple, strong statements. These in brief are:

Modern gas service cuts cooking costs.

Results in kitchens, country wide, prove this beyond question.

A survey of the reader's kitchen may disclose similar savings for him.

His gas company will make this survey for him without obligation.

They are not presented as a cure-all, but as a common-sense approach to a problem that requires the fullest cooperation of the local gas company and manufacturers to provide the real solution. Their main object is to provide a "service" approach for the gas man and a means of getting him and his commercial cooking customers together.

The advertisements will appear in the three leading hotel and restaurant publications—*Hotel Management*, *Restaurant Management* and *American Restaurant*—and will provide a background for aggressive sales promotion activities by gas companies and manufacturers.

The advertisements will be supported by a well-organized publicity campaign consisting of a series of articles that discuss constructively the advantages of gas, standards by which to measure the value of fuel, helpful hints on better use of gas, modernizing for lower cost, etc.

Start of National Modernization Drive

The number of prospects it will reach is naturally limited. Every city has many restaurants, hotels, hospitals, etc., that are an open invitation to competition. They should be reached to make this effort really effective.

In many communities or areas, local chef and steward publications are available. We recommend that they be used by local gas companies, state or regional associations to further expand this activity. In many larger cities newspaper advertising can be used to get this story over to the market. Considering the importance of this cooking load from the standpoints of revenue and prestige, it would pay the larger gas companies to divert a small percentage of their domestic appliance advertising space and with it conduct an institutional campaign.

This institutional campaign should feature outstanding hotels and restaurants and tell why they use gas. It should show performance records of new and modern gas cooking equipment. In every advertisement the offer of a survey should be made and the advantages of "modernizing" should be emphasized.

Such a campaign would be effective way beyond the immediate market involved. It would reach executives of other industries in your area, it would be effective on house heating prospects, it would be effective on the domestic consumer because it would help sell the widespread use of gas and build prestige for it.

This "modernization drive" also has good direct mail possibilities. Various kinds of direct mail could be used effectively by small and large gas companies. Printed broadsides could be sent out where the market justifies them. Letters, too, could be utilized effectively and economically.

The direct mail should present the results in kitchens as fast as they are modernized and the necessary facts are available. Specific special appliances such as fryers, toasters, vegetable cookers, counter appliances, etc., should be discussed. Copy should also be devoted to the wasteful methods of operating such appliances as bain-maries, steam tables, coffee urns, etc. The value of proper burner equipment and thermostatic control should be demonstrated by actual case studies where applied.

Local Tie-in Important

Here again the offer of the free survey should be made with examples showing how suggestions resulting from other surveys have improved service and food, and brought about greater profits through lower costs.

The wide use of the publication

Cooking for Profit is strongly recommended as a means of bringing the national acceptance of gas before the local users.

Local dealers should be tied in. This program means more business for them. Sell them on the market it will open. Cooperate with them through engineering service and advertising. Insist on adequate and modernized displays on their floors. See that catalogs and sales kits are up-to-date. Be sure they are pushing the sale of modern insulated thermostatically controlled gas equipment.

An active modernization movement by gas companies means more business for the gas companies, dealers and manufacturers, more work for thousands of people. The need for new gas ranges, broilers, toasters, ovens, insulation, heat controls, etc., will be immeasurably expanded to the benefit of the entire industry.

Manufacturers can cooperate in this kitchen modernization at comparatively little cost. Steps should be taken at once by them to show the hotel and restaurant trade how gas equipment has been modernized and improved for better service and lower operating costs. The gas company and dealer salesmen should be supplied with facts on performance of modern equipment in actual use. These facts should be presented in some standardized form so that the salesman can build for himself an impressive and convincing presentation manual.

Manufacturers can supply direct mail that will make local drives most effective. They should tie in with the advertising of the Association in the hotel and restaurant magazines and by doing so help make the gas sections of these publications outstanding in their scope and complete in their presentation of the leadership of gas. The food industry will then be shown what a really wonderful job the manufacturers have done in providing the finest, fastest, most economical cooking equipment. Group advertising directed at a common objective will make each advertiser's efforts more effective.

If gas companies and the manufacturers that have a place in kitchen modernization will adopt this theme for their advertising and sales efforts, and actively promote the idea, a tremendously effective force will be generated. More gas equipment will be sold, and the widespread acceptance of gas will be definitely and effectively advanced in spite of the sharp competition that faces it.

Full information about the plan and the advertising will be covered in a bulletin from the Hotel and Restaurant Committee to be published at an early date.

A. G. A. Supports Maj. Strickler For U. S. Chamber Director

T. J. Strickler

MAJOR T. J. STRICKLER, vice-president and general manager of the Kansas City Gas Company, Kansas City, Mo., has been unanimously elected by the Board of Directors of the Kansas City Chamber of Commerce as its candidate for the directorate of the Chamber of Commerce of the United States to represent the Seventh Election District. Kansas City and the surrounding territory has not had a representative on the board of the United States Chamber for many years, and it was the unanimous opinion that representation was needed at this time and that Major Strickler should be the candidate.

Major Strickler is well known to members of the American Gas Association. He has been active in the affairs of the Association for many years. Recently he served as departmental vice-president and chairman of the Natural Gas Department, and at the present time he is a member of the Managing Committee and Advisory Committee of the Natural Gas Department, as well as a member of the Advisory Council of the Association. He is a past president of the Missouri Association of Public Utilities, and is now serving on the Executive Committee of that association.

He has also served on the Executive Board of the Gas Division of the Oklahoma Utilities Association. The American Gas Association is much interested in Major Strickler's candidacy and has assisted, through its members, in securing endorsements in behalf of his candidacy and in getting commitments of the National Councillors who will attend the United States Chamber of Commerce annual meeting May 1, in Washington, D. C.

Due to the activities of the Kansas City Chamber of Commerce, the American Gas Association and Major Strickler's many friends, over 500 endorsements had been received up to March 12, when his campaign folder went to press. These endorsements consist of outstanding national trade associations and leading communities of the United States.

In addition to endorsements and the cooperation of the American Gas Association, endorsements have been received from the Pacific Coast Gas Association, Southern Gas Association, Empire State Gas and Electric Association, American Petroleum Institute, American Transit Association and more than fifty other national organizations.

The enthusiastic support Major Strickler's candidacy has received is largely due to his activities in the affairs of his city, State and nation during the past twenty years. In addition to his affiliation with the American Gas Association he has served several terms as vice-president of the civics department, Kansas City Chamber of Commerce; served on many important committees of the chamber, and has been Kansas City's National Councillor on several occasions at national chamber meetings. He has served as president of the Kansas City Section, American Society of Civil Engineers; president of the Kansas Engineering Society; commander, American Legion, Department of Missouri; president of the Kansas City Safety Council, and vice-president of the University Club. In 1928 and again in 1929 he was general chairman for the Kansas City Charities fund.

The splendid work that the members of the American Gas Association have done in securing endorsements in behalf of Major Strickler's candidacy is a long stride toward success, but continued cooperation is necessary to secure enough commitments from national councillors who will attend the United States Chamber of Commerce meeting in Washington to assume his election.

To Represent A. G. A. At Zurich

Past president Clifford E. Paige will represent the American Gas Association at the Second International Gas Conference which will take place in Zurich, Switzerland, September 1-4. It is likely that he will be accompanied by other A. G. A. members.

Mr. Paige, who is a vice-president of the International Union, also is vice-president of The Brooklyn Union Gas Company, Brooklyn, N. Y. He will submit a paper on "Developments from Coordinated Research and Coordinated Rate Making."

According to Fritz Escher, of Zurich, president of the Union, papers on various subjects relating to the gas industry also will be read by representatives from Great Britain, France, Germany, Belgium, Switzerland, Czechoslovakia and other countries.

Applying Nature's Own Method Of Cooling To Gas Air-Conditioning

By Eugene D. Milener

IN the development of a complete air conditioning service with gas, covering twelve months of the year, it has been pointed out repeatedly by the American Gas Association's Committee on Industrial Gas Research that there are four factors that apply to winter air-conditioning and four factors that apply to summer air-conditioning. These definite factors which were first analyzed by the committee in 1930 and 1931, and presented at that time to the air conditioning industry, since have become the standard method throughout heating and ventilating circles, of defining both winter and summer air-conditioning.

This analysis follows:

To Produce Winter Air-Conditioning

It is necessary to:

1. Heat
2. Humidify
3. Circulate
4. Clean

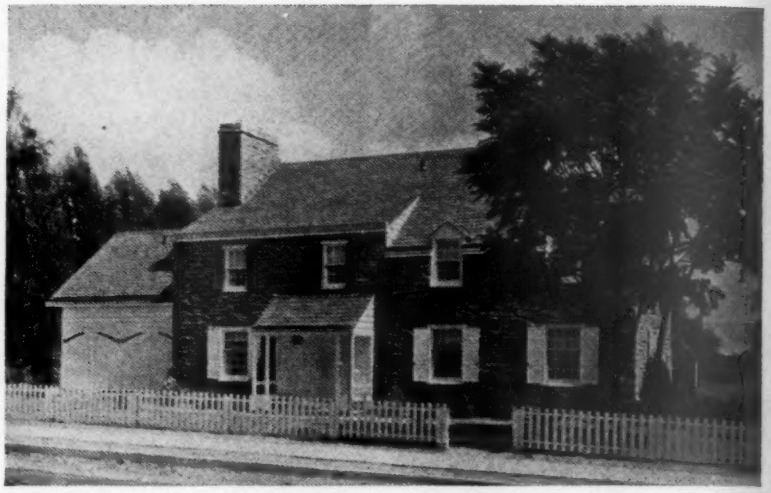
To Produce Summer Air-Conditioning

It is necessary to:

1. Dehumidify
2. Cool
3. Circulate
4. Clean

To define the combination of the two the committee coined the phrase "year 'round air-conditioning" and it is the gas load represented by "year 'round air-conditioning" that should be the goal of the entire gas industry.

As has also been repeatedly pointed out to the gas industry, we are in a strong position to furnish all of our customers with the finest winter air-conditioning service that is available to them from any source. Equipment that will heat, humidify, circulate and clean the air, all under accurately controlled conditions is regularly being produced and sold by manufacturer members of the American Gas Association. There need be no hesitancy on the part of any gas company in selling complete winter air-conditioning with the assurance that any conditioning of the air to meet climatic conditions or individual preferences can easily be met.



The home of controlled climate conditioned the year 'round with gas

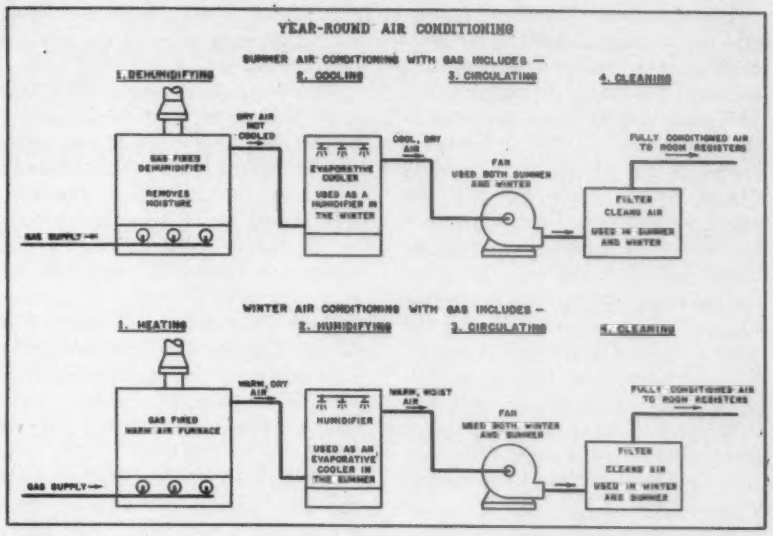
Committee Works Out Method

In the summer, in order to give complete air-conditioning, there must also be provided four factors, as shown above. Two of these factors are the same as those used in the winter. These are cleaning and circulating the air and they are accomplished by the identical equipment used in the winter. It can therefore be seen that in order to provide year 'round air-conditioning the only missing links have been dehumidifying and cooling. If these two are added to a modern gas-fired winter air conditioning plant, year 'round air-conditioning becomes an accomplished fact.

A practical method of accomplishing this, particularly for residences, was worked out under the sponsorship of the Research Committee. This is known as the direct dehumidification method. By this method the moisture in the air is readily reduced from the mucky, sticky condition that helps to make air so uncomfortable in the summer, to a degree of dryness that is conducive to a feeling of greater coolness and therefore greater comfort. Gas-operated dehumidifiers for accomplishing this have been designed, built and extensively tested in the field in various climates throughout the country. During these tests it was conclusively demonstrated that by means of gas it was possible to reduce the humidity of a building during the summer to exactly that point that felt the most comfortable to the occupants. The greatest comfort is generally experienced when the relative humidity is between 40 per cent and 50 per cent. Outdoor relative humidity in the summer frequently reaches 75 per cent or 80 per cent, which at that time of the

year is usually thoroughly uncomfortable.

But on top of this reduction of humidity a reduction of temperature is also required in order that the air will be conditioned for maximum comfort during the summer. In the early tests sponsored by the Research Committee this factor of cooling was accomplished by passing air directly over water coils, the water being at the temperature received from the mains. Where the water temperature is low enough and water is plentiful, this method of cooling is entirely satisfactory. Later tests utilized indoor water towers. By this means the same water is used continuously, although certain limitations as to the amount of cooling are experienced. However, in many localities the method has merit.



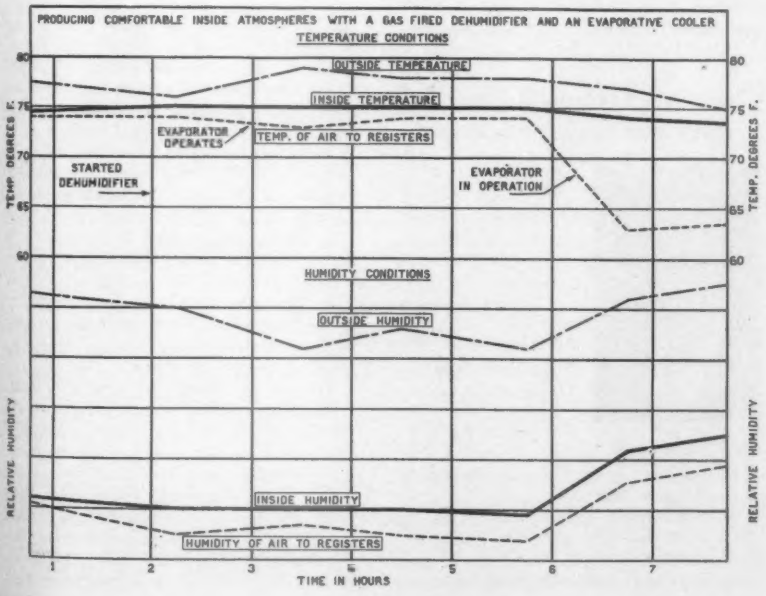
Evaporative Cooling

The third step in the series of experiments on the cooling factor utilized what is known as evaporative cooling. Cooling by this method is independent of the temperature of water and is independent of the amount of water that might be available. It is nature's own method of cooling and because of that fact it is probably the simplest method of cooling air that has ever been devised.

Have you ever noticed how cool the air becomes when, on certain summer days, you sprinkle your lawn and the water begins to evaporate? That cooling effect is caused by the water on the lawn evaporating into the air. You have noticed that if the air is dry the evaporation will continue and the air will continue to be cooled. You have also probably noticed that if the air is mucky or damp the water will not evaporate and therefore the air will not be cooled. That is the simple principle of evaporative cooling which has been applied to gas summer air-conditioning.

During the research and development period the application has been worked out and applied in the following manner:

Air to be supplied through the registers is thoroughly dried in the gas dehumidifier by the adsorption method. Its heat of activation is removed by a small water coil in the dehumidifier. (The heat of activation is a relatively small amount.) The air leaving the dehumidifier is therefore at about outdoor temperature but is very dry, in fact it has been deliberately "super-dried." This very dry air then passes through the evaporator (spray box) during which water is evaporated into it the same as water sprinkled on the lawn evaporates into the air. And the effect is exactly the same; that is, the air is cooled.



Simplicity

While being cooled, the air has also become partly moistened due to the water it has absorbed. But, as it had previously been super-dried, this controlled amount of moisture causes the air to have a final resulting relative humidity of between 40 per cent to 50 per cent, the correct figure for summer comfort.

The simplicity of summer air-conditioning by this method can easily be seen. Its commercial success simply depends upon the ability to dry air cheaply. Dried air then becomes the tool for accomplishing the two factors needed to turn present-day gas winter air-conditioning into complete year 'round air-conditioning.

The Research Committee cooperated in equipping a dwelling for evaporative cooling and in conducting field tests to determine its practicability. This was a display house sponsored by the Philadelphia Gas Works Company known as the "Home of Controlled Climate." The house was originally also equipped with direct water coils for cooling, the same as the earlier test houses of the committee. However, the success of the evaporative cooling method was so pronounced that the water coils have been removed and entire dependence for cooling is now placed on the evaporator or spray box.

The cost of conditioning this house from cellar to garret during the summer weather with evaporative cooling is as follows:

For one full hour's operation—

180 cu.ft. gas (535 B.t.u.) at 50c per M	$0.09
1½ H.P. at 3c per kw.hr.	0.05
6 gal. water per minute at 40c per M cu.ft.	0.02
	$0.16

The above cost includes the entire cost of power for driving the air through cleaners or filters and for circulating the air throughout the entire house.

Experience is still too meager to foretell how many hours of full operation the average family will use a complete air conditioning plant in the summer, but indications are that it will be between 500 hours and 750 hours. The season's cost for houses similar to this would be somewhere between the following:

500 hours × 16c per hour—$80.00 per season.

600 hours × 16c per hour—$96.00 per season.

Nature's Own Method

In all cases evaporative cooling will have to be balanced against the cost of cooling by direct water coils. (See March, 1933, A. G. A. MONTHLY for detailed operating cost of conditioning houses with gas dehumidifying and water coils and indoor water towers.) It has, however, many advantages from the gas viewpoint beside simplicity. Among the most important is the fact that with evaporative cooling a greater proportion of the total operating cost is for gas than when direct water cooling or indoor water towers are resorted to. Also comparatively warm water can be used.

That evaporative cooling, when used in conjunction with gas dehumidifying by the adsorption method, is an effective tool for summer air-conditioning is shown by the chart herewith. Even though the tap water temperature is 74°, the air being delivered to the registers is below 74° whenever the evaporator is in use. This is impossible with direct water coil cooling. This fact is important when considering the form of summer air conditioning competition experienced when power energy instead of gas heat energy is used.

Mechanical refrigeration produces very low temperatures in the refrigerating coils, in fact considerably lower than is needed for reducing the air temperature to a comfortable point. These low temperatures from refrigeration are used as an indirect means to dehydrate the air.

Evaporative cooling will reduce the temperature of conditioned air to exactly any degree needed without resorting to the excessively low temperatures produced with mechanical refrigeration. This, when used in connection with dehumidifying by gas adsorption will give any condition necessary for perfect summer air-conditioning. Undoubtedly, evaporative cooling, nature's own method, will prove to be a useful tool for making year 'round air-conditioning with gas one of the popular features of our homes in the future.

Charles J. O'Donnell Dies Suddenly at Philadelphia Home

C. J. O'Donnell

FRIENDS of Charles J. O'Donnell, sales engineer of The U. G. I. Contracting Company Division of United Engineers & Constructors Inc., Philadelphia, Pa., were shocked to learn of his sudden death on the night of March 20, 1934, at his home, Oak Lane, Philadelphia. He suffered a heart attack.

Mr. O'Donnell, known throughout the gas industry as "Charlie," was in the employ of The United Gas Improvement Company and affiliated companies for thirty-five years, entering service in June, 1899, after having attended North East Manual Training School and the Drexel Institute, Philadelphia. Until 1908 he was with The Philadelphia Gas Works Company as photometer reader, assistant chemist and cadet engineer, engaged in the operation of the plant and laboratories.

Then followed short periods with the Minneapolis Gas Light Co., The U. G. I. Co. at Philadelphia, the Peoples Gas Light Company at Manchester, N. H., in general operation of plants. While at Manchester Mr. O'Donnell operated the first U. G. I. vertical retort coal gas plant installed in this country.

From 1911 to 1917 he was assistant in the Department of Test and Research, covering development and operation of new plants and processes, particularly vertical retort settings and waste heat boilers.

For three years he was on the staff of the general superintendent of The U. G. I. Co. rendering expert assistance in the operation of plants in many parts of the country.

From 1930 to the time of his death he was sales engineer of The U. G. I. Contracting Company Division.

He was a member of the American Gas Association, New England Gas Association, Southern Gas Association, and the Wisconsin Utilities Association.

During his business life he came in contact with many members of the gas industry and wherever he went, his ability was quickly recognized and respected, and his quiet unassuming attitude, ready smile and good fellowship won for him a host of friends.

Real Safety Progress

IT is with much satisfaction that we observe from time to time the outstanding work of our state wide public utility fraternity in promoting safety and first aid education, cooperating in city wide safety programs, demonstrating and instructing in resuscitation and encouraging thousands of people to think and act safety. Drill teams continue to demonstrate, talks are given and lives are being saved.

In many communities the people turn first to the utility workers, knowing that they are equipped with useful information and often with the devices most useful in effecting rescues. Each truck with pipe, ropes or ladders passing along a street is a veritable life-saving station.

Recently two boys went through the ice at Madison and two service men of Madison Gas & Electric Co., Louis Korbein and Elmer Henry, called to the scene, saved one and promptly recovered the body of the other. With rope and ladder from their truck, cool heads, brave hearts and trained minds, these men demonstrated most eloquently the true spirit of public service.—*Wisconsin Utilities Association Activities.*

Why Gas Is Superior For Large Volume Cooking*

By Thomas J. Gallagher

The Peoples Gas Light & Coke Co.

ONE of the gas industry's greatest problems is to have its customers utilize the universal fuel "Gas" efficiently and economically to obtain the maximum benefits of gas service. There are three important ways of securing these maximum benefits. First, the installation of correct gas appliances; secondly, keeping the appliances operating at their greatest efficiency; and thirdly, curtailing the needless waste of gas in the kitchen.

Elaborating on the first point of correct gas appliances, you all know that it has been a practice of many years for the equipment jobbers to make their own gas ranges and sell them to you. The sad part of the situation is that the equipment jobbers do not know all there is to know about manufacturing gas ranges. They have been vying with one another as to who could make the heaviest unit and even went as far as to use railroad iron in their construction. They used all types of gas burners. They were not interested in the amount of gas the burners consumed, because, after all, if they consumed excessive quantities of gas and the customers received excessive bills, the natural alibi would be that the gas was too expensive and that it was the gas company's fault. It has also been the practice of overloading the kitchen—sell as many appliances as there was space in the kitchen. Too much equipment was sold per a given job. Naturally the cooks will use all the appliances and this of course results in higher operating costs.

Now the recognized equipment dealers are fully convinced that the gas companies are good will institutions and that they want their customers to have the smallest gas bill possible. They realize that the gas industry has spent thousands of dollars in research work to perfect efficient and economical appliances. I attended a recent meeting in New York of leading dealers. They readily admitted their shortcomings regarding gas appliances and said that they needed the cooperation of the gas industry in their work. I do not mean to infer that the club managers should purchase their equipment from the local gas company, but I do insist that you should ask the gas company for advice as to the best gas appliances for your specific requirements. If you follow their recommendations you can rest assured that you purchase appliances that are scientifically designed and manufactured according to the specifications of the American Gas Association.

Inefficiency Is Expensive

Let me say a few words on my second point of "Keeping the appliances operating at their greatest efficiency." Efficiency is only obtained by correct adjustments. Poor efficiency means increased costs and therefore adjustment of appliances is a very important matter to you. The chef cannot work with dull knives or saws or with broken cleavers, and why should he work with a gas range that is not properly adjusted. How in the name of common sense can you expect a poorly adjusted appliance to do good work. If you take a round of beef and try to roast it in an oven that is not correctly adjusted you will waste a considerable amount of gas as it will take longer for it to cook. The local gas company knows how to adjust the burners so that they will have a snappy blue heating flame. They know how much gas the different types of burners consume and they make the air adjustments accordingly. I am sorry to say that there are a great number of operators who think that the stationary firemen, engineers and even the porters can adjust their gas appliance efficiently. Please have the appliances adjusted by some one who knows how.

My third point of "Curtailing the needless waste of gas in the kitchen" is also another very important item. How many times have you gone into the kitchen and have seen ranges and broilers burning gas with no food being cooked. How often have you found a twenty-five- or thirty-gallon kettle filled with boiling water with the gas flames reaching up over the sides. If it were possible to burn twice as much gas with the burner under this kettle, the water could not get any hotter, but would only result in a high evaporation point. High flames and especially those sweeping high over the sides of the vessels do not hasten the cooking but produce high bills and higher kitchen temperatures. Instruct the cooks to turn off all unnecessary burners. We made a test in the Drake Hotel, in Chicago, and watched the operation of the ranges. One man spent one hour a day for a period of thirty days in visiting the kitchens and shutting off unnecessary burners. The chefs became alert and soon started doing the same thing. The gas bill was reduced 11½ per cent, quite a substantial reduction. Wasted gas is not good for anyone, it is not good for the gas company, it is not good for the customer.

About Daily Consumption

Another way of curtailing waste is to read the gas meter every day at the same hour. Every man can learn to read his gas meter in about three minutes. By reading the meter every day, you can obtain the exact amount of gas used daily and you can readily determine if the cooks are wasting any gas. You all know what the milk, meats, etc., cost every day so why don't you make it a point to know how much gas was consumed. You might say that the gas bill gives you the gas costs. The gas bill you receive is for gas consumed for a month or thirty days. Ordinarily you receive the bill ten days after the meter was read. An

*Digest of address before Club Managers' Association of America, Kansas City, Mo., March 6, 1934.

additional ten days is given you to pay the net amount. Fifty days have elapsed since you first started using the gas. You cannot remember fifty days back what your cooks did with the gas. But if you read the meters every day, the chefs can readily account for any increases or decreases.

Another important item which every club manager should know is the rates charged by the various utilities for the service they supply. Become acquainted with the fact that many local gas companies have volume rates. We find some kitchens, besides using gas for the majority of the cooking also use other fuels for their other operations. Let us take an example. Here is a restaurant using three sections of gas range, one charcoal broiler and one electric bake oven. I am quite sure that if the operator of this restaurant used gas exclusively he would be able to get a lower rate or if he was enjoying the best possible rate, all the additional work could be done with the gas purchased on the lower brackets of the rate schedule.

I am going to tell you something about the new equipment that has been especially built for clubs and restaurants. The gas industry started in 1929 and up to date has spent a little over $100,000 in research work on scientific volume cooking. The first problem of the committee in charge of this research work was to prepare specification for a modern, economical, durable and substantial range.

Scientific Cooking

The new gas appliances are indeed revelations. They are thoroughly insulated, thermostatically controlled and economical. Insulation assures cooler kitchens, more comfortable working conditions, cuts fuel costs and confines the heat to where it is needed. Thermostats or automatic heat controls maintain any heat desired, assure better results and reduce fuel costs. You know cooking is just as scientific a thing as we have under the sky. It is no secret that your cooks are always striving to produce a uniform finished product. The only way you can obtain uniform products, day-in and day-out, is by uniform temperatures employed in the cooking of food. Not one man in a thousand can come within twenty degrees of guessing the temperature of an oven. Previously, the chefs determined the approximate temperature of the oven by the feel of their hands. They stuck a fork in the meat to see if it was cooked. But now, the new equipment takes the guess work out of all cooking. With a thermostatically controlled oven, you have nothing more to do but season the meat and put it in the same temperature for the same number of hours or minutes every day.

This new equipment will reduce your gas bills. It will pay you to remove the old equipment that has been in use for five to ten years. The new equipment will pay for itself within a very short time. From past experiences, a new installation will effect between 20 to 30 per cent savings. In one instance in Chicago, The Congress Hotel reduced its gas bills more than 30 per cent per month with the installation of new ranges.

Please remember that the gas companies are interested in having their customers utilize their service as efficiently as possible. They want satisfied customers. Call on your local gas company if you want to try to reduce fuel costs. If it can be done they will gladly show you how.

House Heating Bibliography

THE following articles appearing in various trade journals undoubtedly will be of interest to gas house heating personnel:

Domestic Engineering ..... Air conditioning job is operated with gas ..... Jan. 1934 p. 50

Gas Age Record. Gas industry must stake its claim in 1934 ..... Jan. 27, '34 p. 71

Gas serves world's largest public hospital; Los Angeles County General Hospital ..... Jan. 13, '34 p. 33
(All heat and power from gas fired steam boilers.)

How service helps to hold and sell house heating ..... Jan. 13, '34 p. 35
(Servicing methods of one gas company.)

Jersey Central office boasts air-conditioning equipment ... Feb. 24, '34 p. 185
(All-year-round circulation of filtered air. Automatic humidification and heating in winter with provision for adding refrigeration or tap water cooling for summer time use.)

Gas Age Record—*Continued*

Operation of gas-fired home heating plan ..... Feb. 3, '34 p. 109

Heating and Ventilating ..... Modern Dallas buildings heated and conditioned by gas ..... Feb. 1934 p. 25

Industrial gas ..... Heating and ventilating a large garage—the modern way ..... Feb. 1934 p. 18
(Ventilating system designed to remove auto exhaust effectively. Overhead unit heaters use steam from automatic gas fired boiler.)

Prize Competition For Articles on Gas Industry

WITH a view to fostering an increased interest in some of the principal activities of the gas industry, West's Gas Improvement Company, Ltd., Manchester, England, has announced the inauguration of a competition in which prizes will be awarded for the best articles under the five following general headings: "Coke," "Technical Control of the Gas Works," "Industrial Gas," "Gas in the Home," and "Tar."

In view of the interest this competition is expected to arouse it is open to contestants in any part of the world.

While articles will be limited to 4,000 words, mere length will not be accounted a virtue, according to the announcement of the competition.

The five subjects are divided as follows:

1. *Coke*—Grading and cleaning; weighing and bagging; sale and delivery; applications to domestic and industrial uses; the open fire; central heating, etc.

2. *Technical Control of the Gas Works*—The importance and extent of the application of technology to this purpose; use of scientific methods and instruments; weighing, measuring, sampling and analysis of coal and coke; observation of temperatures and pressures; analysis of gas and by-products, records, etc.

3. *Industrial Gas*—A general account of the use and application of gas in industry and manufacture; methods of securing the business; planning the sales campaign; construction of tariffs; comparison with other fuels.

4. *Gas in the Home*—Domestic uses of gas; gas lighting in the home; its possibilities; room heating; water heating; central heating; house cooling and air conditioning; future development; relation between gas and competitive fuels.

5. *Tar*—Factors affecting the quantity and quality of production; tests and analysis; preparation for market; road tars; tar oils; pitch; economics; organization of development and sale.

General Information

Articles will be limited to 4,000 words, but mere length will not be accounted a virtue.

PRIZES

Twenty guineas for the best, and ten guineas for the second best article under each heading. (Twenty guineas is £21 which at $5 to each pound is equivalent to $105. Ten guineas is £10.10s (£10½) which at $5 to each pound is equivalent to $52.50.)

George Evetts, M.Inst.C.E., Consulting Engineer, London, has consented to act as judge, with the assistance of such specialists as may be deemed necessary.

Names of the competitors will not, of course, be given to the judge, but full details of the conditions of the competition will be issued on application.

ENTRANCE

Entrants for the competition should make application as soon as possible to the Editor of *West's Gas* (or, in the case of competitors' resident abroad, to the nearest representative of West's Gas Improvement Company) for a copy of the Rules of the Competition.

CLOSING DATE

All entries from the United States must reach West Gas Improvement Company, 426 Madison Avenue, New York, not later than June 10, 1934.

The successful articles will be published in the Summer Number of *West's Gas*, which will take the place of the August and September issues. The Editor reserves the right to publish any, or all, of the articles submitted. For any articles which, while not adjudged winners in the competition, are selected for publication, prizes of a nominal amount will be awarded.

Further details regarding rules of the competition may be had upon application to the West Gas Improvement Company, 426 Madison Avenue, New York, N. Y.

To Create Memorial For Sir Arthur Duckham

A MOVEMENT has been launched in London to create a memorial and tribute to Sir Arthur Duckham, one of England's distinguished sons, for his conspicuous service to industry in general and the gas industry in particular. The undertaking is sponsored by The Institution of Gas Engineers, which has appointed the Sir Arthur Duckham Memorial Fund Committee, which has issued an appeal for contributions, which, it is hoped will be sufficient to endow a "Duckham Research Award," to be applied to investigations of interest to the gas industry in Great Britain and elsewhere.

It is believed that the latitude thus permitted in making the award will comment itself to the rank and file of the gas industry in the United States, where Sir Arthur was widely known before his death two years ago.

Frank P. Tarratt, president of the Institution, is chairman of the Memorial Fund Committee, and J. R. W. Alexander, secretary of the Institution, is honorary secretary and chairman. Mr. Alexander should be addressed in care of "Sir Arthur Duckham Memorial Fund, 28, Grosvenor Gardens, London, S. W. 1."

Besides Messrs. Tarratt and Alexander, many members of the Duckham Committee are well known to the gas industry in this country. Among these are noted Sir Frances Goodenough, Sir David Milne-Watson, William Cash, E. W. Smith and others.

Canadian Gas Industry Shows Improvement

George W. Allen

By George W. Allen

Secretary-Treasurer, Canadian Gas Association
Editor of The Gas Journal of Canada

MORE manufactured gas is used in Canada today than was the case ten years ago, and while the depression years brought about a reduced demand, it was not to the same extent as that felt by many other national interests. The most recent reports on the sales of manufactured gas in Canada reveal the encouraging fact that the output for the year 1932 was but 1½ per cent below that as recorded for 1931 in *The Monetary Times Annual* of January, 1933. Sales of gas since August, 1933, have shown a decided improvement.

While the report for 1933 is not yet completed, what information is to hand is very encouraging to the gas interests. It is expected that the summary of the year's manufactured gas sales reports will reveal an output of approximately 17,000,000,000 cubic feet, just a little below the output for 1929, a year in which the industry reached the highest point of development in over 85 years of its Canadian history.

The number of manufactured gas meters in use in Canada approximate 533,000, while natural gas meters exceed 128,000, making a total of 661,000 meters in actual use.

Coke Production Advances

Over 25 per cent of the manufactured gas companies of Canada reported an actual increase in output of gas during the last recorded year, while a still further 25 per cent just held their own. Fifty per cent recorded drops in gas sales of from 2 to 8 per cent only.

Since most of the gas plants in Canada are also coke producing units, it is interesting and encouraging to note that the production of coke in 1933 will exceed that of 1932 by approximately 148,000 short tons. Since every ton of coke produced involves also a production of gas, the full report should reveal a substantial increase in the amount of gas made in 1933 over that of 1932.

Notwithstanding the fact that the gas industry has had to meet, and is facing, very keen competition from its friends in the coal, oil, electricity and other fuel fields, it is moving ahead in spite of all comers. It has a place in the economic development of Canada which it alone can most efficiently fill, and with the increased activities along fuel research lines which the gas industry is bringing forward each year, it is even better equipped than before to meet any fair competition which may come its way. The gas industry is doing everything within its power to instill into the minds of its public contact men a thorough understanding of the principles of correct gas fuel application to the end that higher efficiencies might result and greater comforts and satisfactory services may be rendered to its hundreds of thousands of gas consumers.

The many remarkable changes that have taken place within recent years in the construction, performance and efficiencies of domestic gas appliances, and the many hundreds of industrial and commercial appliances now available for most any factory or commercial heating operation, to which is coupled the modern home and building units now available for mansion or cottage heating, gives gas fuel a tremendous advantage where heat is in question.

Laboratory Seal

The Canadian and American Gas Associations, in cooperation with many other national organizations, have done much within the past five years towards making gas appliances, especially those for use in domestic service, the most modern, safe and efficient equipment that money can buy. Laboratories are maintained to this end, and the illustrated symbol or insignia, shown herewith is known as the Laboratory Approval Seal, which when affixed to a gas appliance indicates that it has been approved by the Canadian or American Gas Associations.

This seal of approval when shown on a gas appliance is a guarantee to the user that the particular appliance has met the requirements for safety as laid down by the Laboratory Approval Requirements Committee of the Associations mentioned. Improvements of this character have done much towards removing the former objections that some had towards the use of gas, and has been largely responsible for the greatly increased number of sales of gas appliances that have been made throughout Canada during the past few years.

The writer recently stated that "not only in the homes is gas making such rapid strides, but in the industries of Canada it is being adopted as a very necessary fuel in thousands of process operations from steel treating to syrup manufacture." Research engineers who are studying the problem of even greater efficiencies in the application of gas fuel, state that the gas companies have made but the barest beginning in developing the tremendous markets awaiting them in the industrial and commercial fields alone. Manufacturers are becoming more than ever convinced that absolute control of temperatures incidental to the success of many process operations, is

(Continued on page 142)

Natural Gas Developments In Central Europe

OUTSTANDING achievements of the Central European Operating Division of European Gas and Electric Company, during 1933, are contained in a report just submitted to President Henry J. Pierce, of New York, N. Y., and made public last month.

According to the report, made by Paul Ruedemann and Ing. Oskar Taussig, vice-presidents, of Vienna, Austria, a concession on all of the oil and gas rights in Hungary, south and west of the Danube River, was obtained in June, 1933, by act of Parliament. This is about one-half of the country, covers about eight million acres and is regarded as an extremely valuable property.

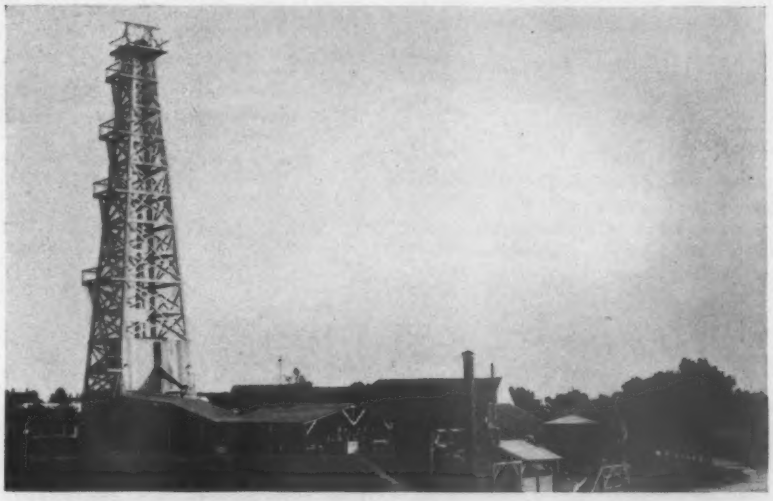
During the year, oil and gas rights on the sedimentary basin near Graz, Southeastern Austria, adjoining the Hungarian concession on the West were acquired. This consists of more than a half-million acres and gives the company complete control of the prospectitve gas area in this industrial center of about 160,000 inhabitants. In other parts of Austria other concessions were taken so that the company now controls more than 90 per cent of prospective gas fields of the country and about 50 per cent of the prospective oil lands.

Mineral rights, including oil and gas in an area of about 600,000 acres was obtained in Czechoslovakia. This property adjoins the Eurogasco Hungarian concession on the North.

Vienna Gas Sale Contract

A contract was closed with the Vienna Municipal Electric Works to supply gas to its Simmering power plant, starting with an initial volume of four million cu.ft. per day. The demonstration of the use of gas in this plant with the most efficient boilers in the city will be an incentive to the further development of the use of natural gas.

Under a decision of the Federal Cabinet the Eurogasco Oberlaa-Simmering pipe line project was declared a "preferred undertaking." This grants the company condemnation rights from which there is no appeal. The privilege has seldom been granted since the war and then only to governmental or semi-governmental projects.



First drilling rig of the European Gas & Electric Co., outside of Vienna, Austria

An agreement was reached with the Federal railroads and the only private line likely to come into question, whereby the company may cross these railroads with pipe lines at any time without delay. This was accomplished after several months of negotiation and in face of the facts that the railroads realize they will lose coal freight because of the company's activities and that the Federal railroads, having the support of the government, are exceedingly powerful.

Eurogasco built and had approved under strict regulations the first high-pressure natural gas line in Central Europe. The principle of transporting gas under high pressures, even inside the city limits, was introduced.

During the year, 7,850 feet of hole were drilled with two drilling crews, the outfits having been moved six times during the period. All this was accomplished in spite of a delay of several months while derrick designs were studied by the authorities after a cyclone had destroyed the structure on one location within the Vienna city limits, and in spite of the difficulty in obtaining drilling sites in an area where farms are so small that it often takes contracts with three landowners to make a drilling site.

In 1932, the drilling costs, including all materials averaged $11.10 per foot (90.2 shillings) and the exchange rate was 8.13 shillings per dollar. By the end of 1933 the costs were reduced to $7.30 per foot (44.9 shillings) although the exchange rate had dropped and an average of only 6.15 shillings was received for each dollar.

The company's largest gas well was discovered, bringing the available daily open flow capacity up to nearly eight million cu.ft. and thereby justifying the pipe line project to the electric works. Also in another well a new gas horizon was discovered, thereby extending the reserves.

After obtaining the Hungarian concession, a geological party was organized. Later, qualified men were engaged for geophysical work. In the short period of operation, two important geological structures were discovered.

Affiliated Association Activities

Mid-West Gas Association

MANY leaders of the industry will speak at the twenty-ninth annual convention of Mid-West Gas Association, which will take place at the Hotel Warrior, Sioux City, Iowa, April 16, 17 and 18. Following is the advance program:

MONDAY, APRIL 16

Morning

9:00 to 10:00 A.M.

Registration—Warrior Hotel

10:00 A.M.

Opening Remarks
Robert L. Klar, President
Mid-West Gas Association
Des Moines, Iowa

Address of Welcome
Honorable W. D. Hayes
Mayor of Sioux City, Iowa

Response
G. A. Neal, Vice-Pres. & Gen'l Mgr.
Sioux City Gas and Electric Co.
Sioux City, Iowa

Our Gas Industry
Alexander Forward, Managing Director
American Gas Association
New York, N. Y.

Report of Secretary-Treasurer
Report of Auditing Committee
Election of New Members
Report of Nominating Committee
Election of Officers

12:15 P.M.

LUNCHEON RECESS

Afternoon

2:00 P.M.

Report of Technical Representative, A.G.A.
P. A. Stover
Central States Electric Company
Cedar Rapids, Iowa

Experiences in Cracking and Mixing Various Gases
J. A. Perry
United Gas Improvement Company
Philadelphia, Pa.

Servicing House Heating Equipment
F. J. Gunther, Asst. Gen'l Mgr. in Charge of Operations
Iowa-Nebraska Light and Power Company
Lincoln, Nebraska

Load Building Possibilities of Air Conditioning
L. C. Harvey
Bryant Heater and Manufacturing Company
Cleveland, Ohio

Report of Accounting Representative, A.G.A.
A. W. Schmitt
Des Moines Gas Company
Des Moines, Iowa

5:30 to 7:00 P.M.

BUFFET LUNCH

TUESDAY, APRIL 17

Morning

10:00 A.M.

Report of Advertising Representative, A.G.A.
C. A. Nash
United Light & Power Engineering & Construction Company
Davenport, Iowa

Kitchen Planning
Miss Dorothy McGeehan
International Nickel Company
Chicago, Illinois

Faith, Hope and Charity
G. A. Neal, Vice-Pres. & Gen'l Mgr.
Iowa Public Service Company
Sioux City, Iowa

New Home Possibilities
H. J. Carson
Northern Gas and Pipe Line Co.
Omaha, Nebraska

Advantages of Natural Gas to the Local Gas Company
R. W. Hendee
Oklahoma Natural Gas Company
Tulsa, Oklahoma

12:15 P.M.

LUNCHEON RECESS

Afternoon

2:00 P.M.

Report of Commercial Representative, A.G.A.
Stanley Tabor
Iowa-Nebraska Light and Power Company
Lincoln, Nebraska

Rental Sales Plan—Water Heaters
Bernard T. Franck

Convention Calendar

April

9-10 **A.G.A. Distribution Conference**
Book-Cadillac Hotel, Detroit, Mich.

13-14 **Gas Appliance Course & Home Service Conference**
Chicago, Ill.

16-17-18 **Mid-West Gas Association**
Sioux City, Iowa

19-20 **Missouri Association of Public Utilities**
The Elms Hotel, Excelsior Springs, Mo.

24-26 **Southwestern Gas Measurement Short Course, College of Engineering**
University of Oklahoma, Norman, Okla.

May

1- 4 **U. S. Chamber of Commerce**
Washington, D. C.

8-9-10 **Pennsylvania Gas Association**
Wernersville, Pa.

9-11 **Natural Gasoline Association of America**
Tulsa, Okla.

18 **Mid-West Industrial Gas Sales Council**
Palmer House, Chicago, Ill.

12-19 **International Petroleum Exposition**
Tulsa, Okla.

14-18 **National Fire Protection Association**
Haddon Hall, Atlantic City, N. J.

21-22 **A.G.A. Joint Committee Conference of Production and Chemical Committees**
Hotel New Yorker, New York, N. Y.

22-24 **Mid-Year Meeting—American Petroleum Institute**
Pittsburgh, Pa.

24 **National Board of Fire Underwriters**
New York, N. Y.

June

4- 5 **Canadian Gas Association**
Montreal, Canada

4- 7 **Edison Electric Institute**
Atlantic City, N. J.

5- 8 **The Institution of Gas Engineers**
London, England

18-21 **National Association of Purchasing Agents**
Cleveland, Ohio

25-29 **American Home Economics Association**
Pennsylvania Hotel, New York, N. Y.

25-29 **American Institute Electrical Engineers**
Hot Springs, Va.

September

1- 4 **International Gas Association**
Zurich, Switzerland

9 **American Trade Association Executives**
Wernersville, Pa.

11-13 **Pacific Coast Gas Association**
Del Monte Hotel, Del Monte, Calif.

24-28 **American Transit Association**
Cleveland Public Auditorium, Cleveland, Ohio

October

14-19 **American Dietetics Association**
Mayflower Hotel, Washington, D. C.

Wk. 29 **American Gas Association Convention and Exhibition**
Atlantic City, N. J.

American Light and Traction Co.
Chicago, Illinois
Discussion
Heating Equipment
C. A. Nash, Davenport, Iowa
Ranges
Vernon Myers, Sioux City, Iowa

Selling Hot Water Heating the Year Around
H. V. Armstrong, Manager
Electric & Gas Utilities Company
Terre Haute, Indiana

Modern Improvements in Customers' Appliances
R. B. Harper, Vice-President
Peoples Gas Light & Coke Co.
Chicago, Illinois

6:30 P.M.

BANQUET—Ballroom, Warrior Hotel

WEDNESDAY, APRIL 18

Morning

10:00 A.M.

Report of Industrial Representative, A.G.A.
L. O. Rasmussen
Union Light, Heat and Power Co.
Fargo, North Dakota

Three-Point Public Relations Advertising
Stanley Tabor
Iowa-Nebraska Light and Power Company
Lincoln, Nebraska

Utility Advertising
R. D. McCord
McCord Advertising Agency
Minneapolis, Minnesota

Water Heating Sales Through Upstairs Controls
Tom Grant
American Gas Products Corp.
Chicago, Illinois

How to Learn How to Sell
Vernon Myers
Iowa Public Service Company
Sioux City, Iowa

Missouri Association of Public Utilities

JUDGE H. O. CASTER, president of the American Gas Association, will be one of the speakers at the annual convention of the Missouri Association of Public Utilities, which will be held April 19 and 20 in Excelsior Springs, Mo., at the Elms Hotel. His subject will be "The Trend of the Times."

Other speakers, and their subjects, include A. W. Conover, Bristow, Okla., vice-president and general manager, Oklahoma Utilities Co., and member of the National N. R. A. Code Authority, "Our Place in the N. R. A. Picture"; William Chamberlain, Chicago, Ill., chairman of the board. Continental Gas and Electric Corporation, "Tax Equalization"; J. S. Tritle, East Pittsburgh, Pa., president, National Electric Manufacturers Association, "Achievements in Research"; E. A. Freund, St. Louis, Mo., load development engineer, Union Electric Light & Power Co., "Selling Controlled Climate"; N. T. Veatch, Jr., Kansas City, Mo., "Problems of Modern Waterworks Plants"; Frank R. Innes, Chicago, Ill., Western editor of *Electrical World*, "Government Water Power Projects."

An "Open Forum" on the evening of April 19 will be in charge of D. W. Snyder, Jr., president of the Missouri Power & Light Co., as chairman. Three subjects of local interest will be discussed, each subject to be under the leadership of local utility officials. The subjects will be: "A Study of Rates of Municipal and Privately Owned Electric Plants in Missouri"; "Today's House Heating Market"; and "Diversion of Utility Services."

The program is in charge of a committee headed by C. A. Semrad, president of the St. Joseph Railway, Light, Heat & Power Co., as Chairman. Hermann Spoehrer, St. Louis, Mo., Union Electric Light & Power Co., is chairman of the Entertainment Committee, which is arranging a program which will include the annual banquet, dance, and sandwich spread, golf contests for men and women, bridge contests for women, and sightseeing tour.

The Missouri State Speaking Contest, sponsored by the association, will be held on the evening of April 18. Men and women orators, chosen by company members in Missouri, will compete.

The membership of the association includes virtually all of the privately owned gas, electric, water, and electric railway utilities in Missouri. About 250 delegates are expected to attend. Fred Karr, president of the St. Joseph Gas Co., is president of the Association. New officers will be elected at the closing business session of the convention.

Pennsylvania Gas Association

MORE than 300 members of the Pennsylvania Gas Association are expected to attend the association's annual convention on May 8, 9 and 10, at Galen Hall, Wernersville, Pa.

Plans indicate that the program will include papers and discussions on the outstanding problems of the industry. Among these will be kitchen planning, gas refrigeration, problems in the automatic gas water heater field, home service—its use for promotion and good will building, employee training, and accounting problems.

Speakers for both day and evening sessions will be drawn from among the best within and without the industry.

Ample entertainment will be provided to round out an attractive program.

Oklahoma Utilities Association

H. B. Cobban

H. B. COBBAN, of Miami, Okla., general manager of the Northeast Oklahoma Railroad Company, was elected president of the Oklahoma Utilities Association at its annual meeting held at the Mayor Hotel, Tulsa, March 6 and 7.

Other officers elected follow: First vice-president, W. B. Head, Jr., Sand Springs, president of the Oklahoma Power and Water Co.; second vice-president, C. A. Breitung, Ada, Oklahoma manager for the Southwest Gas Utilities Corp. of Shreveport; treasurer, W. R. Emmerson, Oklahoma City, vice-president of the Oklahoma Gas and Electric Co., and E. F. McKay, Oklahoma City, manager of the association.

"Public regulation is proper and can work justice only when applied with equality to all competing in any industry," E. E. McInnis, Chicago, general counsel of the Santa Fe railroad, declared in talking on "Trends in Public Regulation."

"Motor carriers have a legitimate place in the transportation system, but they should be subjected to regulation which will deprive them of unfair advantage.

"Public regulation is not proper and cannot work justice to any industry if the government engages in competition with the industry which it regulates," he continued, "and the government is engaged in the business of transportation upon waterways created or improved with public money, charging rates substantially less than railroad rates.

"The government should get out of business," he commented, "and if it stays in it should conform to the rules of business arithmetic; its undertakings should survive only if in fair competition their revenues reasonably exceed the cost of maintenance, all other operating expense, and the equivalent of interest on the funds supplied by the public treasury.

"Those engaged in public services like all others should cheerfully submit themselves to public needs growing out of public emergency, but they should not be seized as instrumentalities of emergency relief under the pretense of regulation of commerce."

Other speakers were Prof. W. H. Carson of the University of Oklahoma; Earl W. Hodges, New York, of Henry L. Doherty & Co.; A. E. Allen, Dallas, Texas, district engineer, General Electric Company; Ford C. Harper, Oklahoma City, secretary of the State Chamber of Commerce; J. A. Whitlow, vice-president of

(Continued on page 142)

COMMERCIAL SECTION

N. T. SELLMAN, Chairman — J. W. WEST, Jr., Secretary — F. M. ROSENKRANS, Vice-Chairman

Refrigeration Committee Sponsors Competition

BELIEVING that now is the time to get down to the solid fundamentals of sales promotion work, the Refrigeration Committee, Commercial Section, American Gas Association, on April 1, launched an "old-fashioned sales contest." It will continue until June 30, and before that date participating companies are expected to set up new records in the number of gas refrigerators sold.

This has been designated a "Go-Getter Contest," and any gas company is eligible to take part. Any gas company, gas company's sales district office, or gas company's sales branch may register as a unit in this contest. Companies with more than one branch office may enter each branch as a separate unit, or combine all branches and register as one unit. The total number of meters registered will determine in which division the entrant will compete.

This competition is based on the installation of Electrolux refrigerators during the period of the campaign. All Electrolux models, whether water-cooled or air-cooled, will count.

All contestants must register before April 15. Registration must be on forms provided by the Committee. Detailed information will be supplied upon application to J. W. West, Jr., secretary, Refrigeration Committee, American Gas Association, 420 Lexington Avenue, New York, N. Y.

There are six divisions in this contest. Prizes to be awarded are based on the best installation performance in each division. The company making the greatest number of installations during the three-months' period in its division will win the first prize for that division. The first prize in each case will be a blue vase, in addition to cash award.

All awards will be made not later than August 15. In case of two contestants being tied for first place in any division two blue vases will be awarded. First and second prizes will be equally divided between the two, thus eliminating a second prize. Should two contestants be tied for any place other than last, the same procedure will hold. Where two contestants are tied for last place among the prize winners, duplicate awards of the total amount will be made.

Monthly prizes may be won by a single company only once. If the same company is high during any two months of the contest, the second highest company will receive the monthly award. In case of tie, both monthly contestants will win the award.

Six Divisions

In all, the contest will be split among six divisions as follows:

DIVISION "A" (Metropolitan Companies)—This division includes only the following companies: Boston Consolidated Gas Co., Consolidated Gas Co. of New York, The Brooklyn Union Gas Co., Kings Appliance Corporation, Brooklyn Borough Gas Co., Philadelphia Gas Works Co., Washington Gas Light Co., and Southern California Gas Co. of Los Angeles.

First Prize—Blue Vase—$500

2nd Prize....	$300	April Prize..	$100
3rd Prize....	$100	May Prize...	$100
		June Prize...	$100

The following rulings apply only to Division A: Executive sales managers of the companies listed will submit a quota of Electrolux installations for April, May and June. With this quota, the Committee requests a list for the same period of 1933, and if possible for 1932, as a guide in determining the fairness of the quotas established. Each of the above companies will be advised of the quotas set by all others.

The award of prizes in Division "A" only will be based on the best performance against preestablished quotas. All rules governing registration, reports, distribution of prize moneys, and other awards will be the same as in other divisions.

DIVISION "B" (50,001 or More Meters)—In Division B, the larger cities of the country (except those already listed in Division A) are pitted against each other.

First Prize—Blue Vase—$300

2nd Prize....	$200	April Prize..	$100
3rd Prize....	$100	May Prize...	$100
4th Prize....	$100	June Prize...	$100
5th Prize....	$100		

(Note: In Division B, Chicago, Cleveland, St. Louis, Pittsburgh, and Buffalo are not eligible to compete, as in these cities Electrolux sales are directed by factory-managed organizations.)

DIVISION "C" (20,001 to 50,000 Meters)

First Prize—Blue Vase—$300

2nd Prize....	$200	April Prize..	$100
3rd Prize....	$100	May Prize...	$100
4th Prize....	$100	June Prize...	$100
5th Prize....	$100		

DIVISION "D" (5,001 to 20,000 Meters)

First Prize—Blue Vase—$300

2nd Prize....	$200	April Prize..	$100
3rd Prize....	$100	May Prize...	$100
4th Prize....	$100	June Prize...	$100
5th Prize....	$100		

DIVISION "E" (1,001 to 5,000 Meters)

First Prize—Blue Vase—$300

2nd Prize....	$200	April Prize..	$100
3rd Prize....	$100	May Prize...	$100
4th Prize....	$100	June Prize...	$100
5th Prize....	$100		

DIVISION "F" (Less than 1,000 Meters)

First Prize—Blue Vase—$300

2nd Prize....	$200	April Prize..	$100
3rd Prize....	$100	May Prize...	$100
4th Prize....	$100	June Prize...	$100
5th Prize....	$100		

Competition Widely Endorsed

R. A. Malony, chairman of the Refrigeration Committee, stated that this contest will be supported by an intensive national advertising campaign by Electrolux Refrigerator Sales, Inc., and the contesting companies will be provided with effective direct-mailing pieces, bulletins, posters, and other sales promotional helps.

State and regional associations have sponsored and endorsed this contest. Among these are Wisconsin Utilities Association, Pennsylvania Natural Gas Men's Association, Pacific Coast Gas Association, New Jersey Gas Association, Mid-West Gas Association, Michigan Gas Association, Indiana Gas Association, Illinois Public Utilities Association, Empire State Gas & Electric Association (New York) and the New England Gas Association.

Members of the Refrigeration Committee follow: R. A. Malony, chairman, The Philadelphia Gas Works Company, Philadelphia, Pa.; Cyrus Barnes, Charles H. Tenney & Company, Boston, Mass.; W. E. Bolte, The Brooklyn Union Gas Company, Brooklyn, New York; B. O. Brown, Electrolux Refrigerator Sales, Inc., New York, N. Y.; J. D. Dingwell, Jr., Washington Gas Light Company, Washington, D. C.; Stanley Jenks, Northern Indiana Public Service Company, Hammond, Ind.; C. K. Patton, Dallas Gas Company, Dallas, Texas; Clyde Potter, Southern Counties Gas Company, Los Angeles, Calif.; William F. Reid, Manufacturers Light & Heat Company, Pittsburgh, Pa.; F. E. Sellman, Electrolux Refrigerator Sales, Inc., New York, N. Y.; William R. M. Very, Philadelphia Electric Co., Philadelphia, Pa.; E. C. Whitcomb, Lone Star Gas Company, Fort Worth, Texas, and J. W. West, Jr., secretary, Commercial Section, American Gas Association, 420 Lexington Ave., New York, N. Y.

ACCOUNTING SECTION

E. B. NUTT, Chairman H. W. HARTMAN, Secretary A. S. CORSON, Vice-Chairman

Measuring Meter Reading Time Requirements*

By George B. Webber

Public Service Electric and Gas Company
Newark, N. J.

SUPERVISION of the reading of meters is not easy, because of the difficulty in measuring the quantity of effort required to do a day's work. In the meter reading operation there are several units, no one of which is an entirely fair "performance yardstick." This was demonstrated in a study made for the purpose of standardizing meter reading books so that each would represent a fair day's work. In this article will be outlined the nature of the study, which, while not yet put to practical use, shows the effect of each of the units upon the total time required to complete the day's work.

The study was made in a territory served both with electricity and gas, covering thickly populated areas as well as sparsely settled outlying districts. The 340,000 meters, read once a month, were contained in 693 meter reading books, each intended to be one day's work for one meter reader. The meter readers were asked to report the time required to do the day's work in such a way that it could be readily analyzed. The number of meters and premises were counted, and the lengths of the routes measured on maps. The amount of time spent in the office and in traveling to and from the office to the territory, the length of street travel, the number of meters and number of premises were determined for each of the 693 reading books. Then began the task of expressing each of these factors in terms of time requirement.

Interesting Results

An attempt to evaluate the quantity of work required to complete a book on the basis of the number of meters proved that while this is a simple method, it is not a safe basis for the determination of total time requirement. Had the 340,000 meters been evenly distributed among the 693 books, there would have been 490 meters in each book. Actually, the number ranged from 197 to 768 meters per book. Strangely enough, the time reported by the reader of the heaviest book was only slightly over an hour greater than that required to read the lightest book. The reader of the lightest book showed slightly higher production for the month, and was known to be the faster of the two. Even within districts where conditions appeared to be the same, there was a variation of 300 meters between the lightest and heaviest reading books, while the time required to read the books showed little difference.

Thinking that the number of meters read by one man in a month might average up because he had 21 different reading routes to cover during that period, a comparison was made of the monthly total of meters read by each man. While the variation was considerably reduced, there was still a variation of 80 meters a day between the high and low total. This was obviously too great a range to permit the unconditioned use of number of meters as the measure of a day's work. It indicated that there were other elements affecting production that must be considered in the measure.

Divided for Analysis

The following divisions of the meter reading operation seemed logical for purposes of analysis;

1. *Office work*—the time required to obtain and arrange the book in the morning, and to turn in the book and reports at night.

2. *Travel*—the time required to go from the office to the territory to be read, and return at night.

3. *Street distance*—the time required to walk over the streets in the route.

4. *Premises entered*—the time required to walk from the street to the house, obtain admission, go to the meter location, then back to the street.

5. *Meters read*—the time required to compare meter numbers, read, check and enter the index, record the subtraction, and compare it with that shown for the previous month.

The time required for office work was reasonably constant for all meter readers. It amounted to about 35 minutes a day for each reading book. That portion of the day's work thus affected all meter reading books alike.

The time required to travel from the office to the territory and return varied considerably, from twenty minutes to one and one-half hours. To do justice, allowance had to be made for this non-productive variable in measuring production. The books were divided into groups, and a traveling time allowance was made for each group.

The third division, street travel time, likewise varied considerably, running from 1,900 feet to 5 miles. Even this wide variation was defined in terms of time requirement, using four miles an hour as the average speed. Allowance for the effect of varying distance traveled in carrying out the day's work thus became possible.

Most Important Factor

The number of premises or stops on the route is by far the most important single factor in measuring the effort requirement of a given book. It requires much more effort to read 500 meters located in 250 premises, than to read the same number of meters in ten large apartment houses. The number of stops per book varied from 25 to 225, an exceedingly wide range. The average time required for entering a house, as defined under division 4, was 1.6 minutes, which is four times as great as the time required to read a meter as defined under division 5. Having the average time required to enter a house, it was possible to measure the effect of varying numbers of premises upon the effort required to read the book.

Reading meters, division 5, is the second most important factor influencing work requirement. As was previously noted, the number of meters in one reading book varied from 197 to 768. Calculations showed that the time required to read one meter, as defined, was .4 of a minute, or 24 seconds. An exact knowledge of this time requirement was the last factor that had to be known in order to determine the total time necessary to read a book.

All of these factors, put in equation form, gave us a very accurate basis for measuring the time requirement of any given book. The formula was expressed as follows:

Office time; plus travel time; plus street distance time; plus number of meters multiplied by .4 minutes; plus number of premises multiplied by 1.6 minutes equals total time requirement for the meter reading book.

*Contribution of the Office Management Committee.

Two applications of this formula are presented:

Reading book "A"; travel allowance 50 minutes, 4,370 feet of street travel, 702 meters, 55 premises:

Office time	35	minutes
Travel time	50	"
Street distance time	12	"
Reading meters .4 × 702	280	"
Entering premises 1.6 × 55	88	"
Total	465	"

(7 hours, 45 minutes)

Reading book "B"; travel allowance 55 minutes, 15,550 feet of street travel, 318 meters, 128 premises:

Office time	35	minutes
Travel time	55	"
Street distance time	44	"
Reading meters .4 × 318	127	"
Entering premises 1.6 × 128	205	"
Total	466	"

(7 hours, 46 minutes)

The time required to read each book is about the same, although Book "A" has 702 meters, while Book "B" has only 318. Use of the number of meters alone as an index of time requirement would give a distorted picture of the effort requirement in these books.

Exception may be taken to this method of measuring production because it does not recognize accuracy, neatness of figures, customer contact ability, or other desirable ingredients in the meter reading function that can hardly be expressed mathematically. However, it is felt that the method outlined is more accurate than any single factor for measuring the day's work, and that it will provide management with a reasonably safe basis for setting meter reading production standards.

Development in Omaha

THE steady increase in the output of gas has been due to activity in merchandising gas appliances, and in this effort close cooperation has been developed with dealers throughout the city. The rapidly increasing use of Electrolux gas refrigerators and automatic water heaters has been a factor in producing a better all-year load, and the gradual growth of house heating with gas has augmented the winter load. During the year, 222 Electrolux gas refigerators and 417 automatic water heaters were added to the system, and 107 new house heating jobs were installed. A total of 1102 dwellings now are heated by gas.—*Public Service Bulletin,* Metropolitan Utilities, District of Omaha, Neb.

Accounting Section Mourns Loss of W. A. Sauer

W. A. Sauer

IN the death of W. A. Sauer, vice-president in charge of accounts of The Peoples Gas Light & Coke Company, on February 24, at Chicago, the American Gas Association and the Accounting Section lost one of its staunchest supporters.

Mr. Sauer's interest in Association activities was always broad and constructive. From the inception of the Accounting Section his influence was felt in planning the section's activities along practical lines and many of its achievements now stand as monuments to his vision and energetic support.

The Association owes a particular debt of gratitude to Mr. Sauer for his part in the establishment of its Statistical Department at Headquarters. He was the first to sense the far-reaching value of detailed comparison of facts and figures regarding all phases of the industry throughout the entire country. Headquarters have had many occasions to see the wisdom of having such information readily available, not the least of which has been the recent problems involved in the NRA Code.

Mr. Sauer's contribution to Association affairs consisted not alone of the things which bear his name, but of his keen understanding and appreciation of the work of others, which invariably enlisted their best efforts.

The feelings of the members of the Accounting Section are probably best expressed in the following extract from a telegram of the Advisory and Managing Committees of the Accounting Section sent on the occasion of his death:

"His memory will long sustain the splendid tradition of mutual helpfulness he did so much to found among us."

Mr. Sauer was active in Association affairs since 1920 when he first served as chairman of the Committee on Merchandise Accounting. His contributions to the work of the Accounting Section included service also on such committees as Uniform Accounting Nomenclature, the Managing Committee, Committee on Uniform Classification of Accounts, Committee on Scope of Accounting Section, Advisory Committee on A. G. A. Statistics, Committee on Proposed National Classification of Accounts for Natural Gas Companies and many others. He was elected chairman of the Accounting Section and a member of the Executive Board in 1924. He served as a member of the Advisory Council of the Association during the years 1925, 1926 and 1927. He also served as chairman of the General Committee on Taxation in 1927 and 1928 and Chairman of the Subcommittee on Depreciation in Income Tax Adjustment

Mr. Sauer died after an illness of several months, at the age of fifty-five years. He was a native of Chicago and was educated in that city's public schools. He had been in gas company service in Chicago for more than forty years starting as an office boy in 1893 when he was fifteen years old, advancing through the ranks in clerical and accounting work. He became superintendent of the Accounting Department in 1917. In 1919 he was elected comptroller of the company and in 1924 vice-president in charge of accounts. He also was vice-president of the Midland United Company and of the Chicago South Shore and South Bend Railroad. Always active in civic affairs, Mr. Sauer was appointed a member of the Chicago Plan Commission several years ago. He also was a member of the Chicago Club, the Chicago Athletic Association and the Westmoreland Country Club.

In 1910 Mr. Sauer married Miss Rose A. O'Hayer, who survives him. Two children, William E. and Rosemary, also survive. Funeral services were held February 26 at St. Mary's Church in Evanston, Ill. Burial was in All Saints Cemetery.

Committees Arrange Program for Current Year

MEETINGS of the following Accounting Section committees were held in January and February for the purpose of selecting subjects for consideration and otherwise arranging for the year's work:

Customer Relations Committee, A. G. A. Headquarters, January 27; General Accounting Committee, Pittsburgh, January 29; Accounting Machines Committee, Pittsburgh, January 30; Customer Accounting Committee, Pittsburgh, January 31, and Office Management Committee, A. G. A. Headquarters, February 7.

The attendance at the meetings was particularly gratifying, two of the committees having all members present.

E. B. Nutt, chairman of the section, outlined to each committee the program of the Compendium Committee, of which C. J. Fue is chairman. This program, only in preliminary form, but analyzing in a general way the past activities of the section, proved useful to each committee

in more intelligently planning the present year's work.

Mr. Nutt also advised that consideration was being given to the inclusion in the year's activities of a program for luncheon conferences on one day of the convention week when no regular sessions of the section would be scheduled. It has since been definitely decided that the luncheon conferences will be held and a committee has been appointed to arrange the details in connection therewith. The purpose of the luncheon conferences is to promote frank discussion of problems within the scope of each committee and which are not included in the committee reports for the year. A more detailed outline in connection with the luncheon conferences will be announced later.

It was also called to the attention of each committee that in outlining programs for the year that consideration should be given to the preparation of appropriate articles for The A. G. A. MONTHLY, thus affording an opportunity to deal with activities not included in the Convention program, it being the desire that the Accounting Section contribute as many articles as possible to The MONTHLY on subjects of current interest.

Customer Relations Committee,
W. G. Murfit, Chairman

The committee is arranging for an active study of three of the most vital problems of a customer relations nature confronting the section, it being realized that never before in the history of the industry has there been the necessity that now exists for comprehensive and far-sighted plans and action for the promotion of friendly relations with customers. With this end in view, the committee selected the following subjects to be covered:

1. Developing in the Contact Employee a Sense of Responsibility for Good Customer Relations—Louis Stoecker, Chairman of Subcommittee.
2. How Credit and Collection Practices Affect Customer Relations—S. H. Corson, Chairman of Subcommittee.
3. Customer Relations in the Smaller Companies—Jacob B. Jones, Chairman of Subcommittee.

General Accounting Committee,
F. J. Bischoff, Chairman

For subjects to be included in the Convention report, the committee decided upon the following:

1. Comparison of Accounting Practices—E. R. Rotramel, Chairman of Subcommittee.
2. Coding of Accounts—F. W. Cooper, Chairman of Subcommittee.

In considering the first subject, it is intended that a study will be made of the accounting practices followed by a number of companies in charging expenditures to operating expense accounts, such as production, distribution, general and miscellaneous, etc. The study may also include charges made to fixed capital, or other balance sheet accounts. A comparison of the variations in accounting practices will form the basis of the Convention report, in which an attempt will be made to set forth and analyze such differences.

Under the subject of "Coding of Accounts," the purpose will be to present the advantages of a code number system of classification as against the designation of accounts by titles; also, the economies found by companies which have adopted the code number system for classification. It is the intention to present a comparison of the coding systems maintained by some of the companies, and the extent to which the companies carry the number systems through the various steps of underlying records and supporting papers to the general books, balance sheet, etc.

Accounting Machines Committee,
W. F. Bowser, Chairman

Plans were made to continue the work started two years ago on fundamental charts and report on the latest features of accounting and other office equipment now on the market. The committee will also continue the search for additional "Wrinkles," which have always been of great interest.

The following subjects were selected for treatment in the Committee's Convention report:

1. Customers Billing and Sales Statistics—H. E. Cliff, Chairman of Subcommittee.
2. Application of Peg Board and Photo Strip—J. M. Kramarsik, Chairman of Subcommittee.

Considering the first subject, the opinion is that in view of the numerous new developments in machines particularly adaptable to the Utility business, a thorough review of such developments should be made, as to a large extent the accounting departments will have to depend on increased efficiency in accomplishing cost reductions, and to this end, it is believed that the new developments in machines should assist in realizing these results.

The subject of peg board and photo strip representing a method of rapidly compiling statistics, has been quite fully described in other years, but this year it is planned to emphasize the application of the principle by various companies now using it.

Customer Accounting Committee,
E. N. Keller, Chairman

From a long list of important and interesting subjects, the following were selected by the committee for study during the year:

1. Control of Customer Accounting Procedures—L. A. Mayo, Chairman of Subcommittee.
2. Handling of Cash Receipts—W. H. Goforth, Chairman of Subcommittee.
3. Handling of Customers Deposits—R. B. Milne, Chairman of Subcommittee.

The first subject is intended to cover what may be called a manual for office managers and others, including a procedure for follow-up, to enable the management to know that practices and methods as outlined are being followed.

It is intended that the subject concerning the handling of cash receipts cover the control of cash from the time it is received from the customer either by the cashier or collector to its being deposited in bank. The report will be all inclusive and will consider the advisability of using cash registers for receipting bills vs. other methods and the means for keeping control of overages and shortages and the checking of work given to collectors.

In covering the third subject, it is not intended that the subcommittee will outline complete details as to any particular system, but rather to draw comparisons as to how certain features of both the machine and hand procedure are accomplished.

Office Management Committee,
E. J. Tucker, Chairman

The chairman, after having advised that an analysis of former reports indicated that a considerable portion of the material presented, not only concerned the principal aspects of office management but had been fully descriptive of the theories and principles underlying the subjects considered, recommended that the committee this year endeavor to report with regard particularly to the practical application of any systems or routines followed. In view thereof, the committee selected the following subjects for consideration in this year's work:

1. Wage Incentive Plans for Collectors—J. J. Natale, Chairman of Subcommittee.
2. Filing Systems—J. F. Weeks, Chairman of Subcommittee.

In selecting the first subject it was the opinion that inasmuch as the principles underlying the establishment and operation of incentive plans had been very fully dealt with in the past, the committee this year would be of greatest service to the section if it directed its efforts toward collecting information on incentive plans already in use. Covering this specifically and particularly in view of conditions which have existed during the past few years, it is thought that such a study from the standpoint of improving the efficiency of the collecting staff, the effect of wage incentives on collections and the possible effect on public relations would prove to be of intense interest.

The subject concerning filing systems will include a discussion of the relative merits of central filing and departmental filing, methods of indexing and the application to filing of the code for the preservation and destruction of records as recommended in previous reports.

INDUSTRIAL GAS SECTION

F. B. JONES, Chairman C. W. BERGHORN, Secretary J. F. QUINN, Vice-Chairman

Industrial Gas Utilization Technical Helps Available Through A.G.A.

F. B. Jones

By F. B. Jones

Chairman, Industrial Gas Section

TO have a trade association furnish, foster, and disseminate technical data about an industry or a particular branch of science, is nothing new. For years we have had the American Chemical Society, the American Society of Heating and Ventilating Engineers, and many other similar organizations which, as institutions, are leaders of a particular branch of pure or applied science. Similarly, the American Gas Association and its predecessors was at first largely devoted to the technique of manufacturing and distributing gas.

Gradually, as the gas companies themselves gave more and more attention and study to both the sales and technical problems in the use of their product—gas—the American Gas Association has also reflected this change in its activities and sponsorship. This development has been particularly evident in the industrial part of the industry.

The question might properly be raised as to why the gas industry and in turn the American Gas Association should be so active today in sponsoring and disseminating technical information relating to the utilization problems involved in applying gas to industrial heating processes. The answer to this question can probably be found in a consideration of the following conditions prevailing generally today in this industry.

1. In this country the utilization efficiency of all direct applications of fuels to industrial heating processes has never been particularly stressed until recently.
2. Economic conditions during the past few years have caused all industries to study ways and means of lowering fuel costs.
3. In the gas industry, no large equipment manufacturing organization exists to carry the main research and technical load necessary to continually improve the application of gas fuel.
4. The industrial engineers of practically every gas company continually develop new ideas relating to gas usage but as a rule are too busy or too modest to pass such new developments voluntarily on to others in the industry who might be able to apply such information in their own situation.

Industrial Gas Section's Fundamental Objectives Today

Thus, as I view the fundamental objectives of the Industrial Gas Section today, they are of a two-fold character. First, to take the lead in the promotion, advertising, and sales problems of increasing the industrial gas load; and second, to gather, disseminate, and interpret technical information about the use of gas in industry. Sometimes it may be hard to classify a particular Industrial Gas Section's activity as to which of these fundamental purposes it comes under. Again, it may seem to one not close to the picture that the Section's activities jump from one objective to another, but I believe if we keep in mind the two fundamental objectives of the section as expressed above, it will be easier to understand the reason and need for the Section's various activities.

The technical or utilization activities of the Industrial Gas Section have received during the past few years a large share of attention, and I believe this to be a very healthy development for the gas industry. As a result, today a considerable store of up-to-date utilization data and information is available at Headquarters through the Association publications and files.

Industrial Gas Series—Six Books

One of the first outstanding industrial gas utilization activities was started back in 1924 and was known as the "Industrial Gas Series." The first book in this series was "House Heating" and five others followed in rapid succession. The complete listing of these utilization or technical books as they are available today is as follows:

1. Combustion (Third Edition)
2. Steam Boilers
3. Water Heating
4. House Heating (Third Edition Revised)
5. Bakeries, Hotels, and Restaurants
6. Food Products.

Speaking, not as the Chairman of the Industrial Gas Section for the current year and as one who had nothing to do with the preparation of these books, but as an individual Industrial Gas Engineer who in the early days of his experience in the gas industry was appalled at the lack of authoritative, specific, and practical information on the utilization problems involved in industrial gas sales, I can testify to the real help and value these books have been and can be to individual industrial gas engineers and salesmen.

The book on "Combustion," now in its third edition, has been accepted as a text book by many leading colleges and universities in connection with thermodynamics, engineering, and fuel courses. Altogether, 22,000 copies of these books have been sold. Thus, today, there are available authoritative and comprehensive sources of fundamental information on the industrial and commercial applications of gas. At what figure could one place the value of this series to the gas industry?

Industrial Gas Service Letters

In the early part of 1930, shortly after the present economic slump enveloped this country, the first "Industrial Gas Service Letter" was prepared and sent out through the efforts of the section representatives at Headquarters. At first, these letters were designed to provide an interesting and coordinating service in respect to available information on various specific industrial gas applications. Later, as the severity of the economic condition increased, they took on an emergency aspect by calling to the attention of the industry certain threatening trends or developments that endangered a specific industrial use for gas. Sometimes they were designed to warn the industry of impending inroads from competitive fuels. Always they were prepared to furnish all of the authoritative information available on the particular subject considered. Thus in this way these "Service Letters" have served and are serving to supplement the books of the "Industrial Gas Series," which necessarily had to cover a wide range of subjects in a fundamental way. The "Industrial Gas Service Letters," so to speak, make available a post-graduate course for industrial gas engineers and salesmen by furnishing and discussing all available up-to-date

information on a particular industrial gas usage. With this conception of the function of these "Service Letters" it would appear that their field of usefulness is practically unlimited and in fact continually broadens as the art, or technique, of industrial gas utilization progresses.

A complete listing of these "Service Letters" follows:

1. *Selected Bibliography of Articles and Reports on the Industrial Uses of Gas.
2. Information on Malleableizing Cast Iron by the Short Cycle Process.
3. Galvanizing With Gas.
4. Second Selected Bibliography of Articles and Reports on the Industrial Uses of Gas.
5. The Wholesale Baking Load.
6. Changes and Improvements for Rotary Bake Ovens.
7. Third Selected Bibliography of Articles and Reports on the Industrial Uses of Gas.
8. Large Volume Water Heating.
9. Meeting Oil Competition in Commercial Kitchens.
10. Safe Heating of Banana Ripening Rooms.
11. Forging.
12. Supplemental Bibliography of Articles and Reports on the Industrial Uses of Gas.
13. Cooking Practice in Hotels, Restaurants and Commercial Kitchens.
14. Comments on an A. I. A. File Folder entitled "Cooking and Baking by Electricity," Printed December 31, 1932, by the Westinghouse Electric & Mfg. Co., Mansfield, Ohio.
15. Forearming.
16. Competition with Coal for Commercial Cooking.
17. Soft Metal Melting.

Industrial Gas Data Sheets

Over a period of several years a committee of the Industrial Gas Section has sponsored the collection of data sheets on a wide range of industrial gas uses. These sheets have been classified, printed, and are available through Headquarters. The information contained in these data sheets has proved to be a valuable source of information in the preparation of the "Service Letters."

Headquarters' Technical Files and Service

There has been built up at Headquarters, over a period of years, probably the most complete file of technical articles bearing on various industrial uses for gas in this country. In addition, an elaborate correspondence file relating to utilization matters is maintained.

To give an idea of the magnitude of this correspondence and file service, but not necessarily to indicate its maximum usefulness, during the year 1932, 960 industrial inquiries were received and answered by Headquarters. These inquiries covered subjects ranging from alfalfa-drying to zinc-smelting.

The Association has provided also that field services of an industrial engineer can be made available to gas companies wishing specific and detailed help on special problems. As is proper, a moderate charge and expenses are made for any such special help. Confidential reports prepared in connection with such jobs are, of course, not available generally to the industry.

Industrial Gas Research Committee Publications

This Committee has been responsible for initiating, supervising, and following through many research projects over the past ten years, and many reports have been published. However, it is outside of the scope of this discussion to describe or list these reports. The Committee on Industrial Gas Research is responsible to the president of the Association and is not a direct part of the Industrial Gas Section's activities, although there is, and necessarily should be, close cooperation between this committee and the Industrial Section. For information on the research reports, members of the gas industry are directed to communicate with the Secretary of the Industrial Gas Research Committee.

How to Secure Industrial Gas Section's Publications

This information is not given for "membership selling" purposes, but is rather intended to be informative and to clear up any misunderstandings that might exist.

All published material of the Association, not alone of the Industrial Gas Section, that is available, can be purchased from Headquarters at nominal prices. For individual or company members of the Association reduced prices are available on all publications. Individual membership fees are $5 per year if the applicant works for a member company; otherwise it is $8. Registration in one section is permitted for the individual membership fee and additional sectional memberships cost $0.50 each.

Individual Association members, registered also as members of the "Industrial Gas Section," automatically get the current issues of the Industrial Gas "Service Letters," news releases, the *A. G. A. Monthly*, and an opportunity to consult the Association's technical files. All previous publications of "Service Letters," as well as all other publications in stock, can be purchased at nominal prices. Catalogs of all publications available may be had from Headquarters for the asking, and for individuals or companies who have not been using this help let me recommend that they secure such catalog at once.

Need for Close Cooperation Within the Industry on Utilization Problems

It does not seem proper to close this discussion without making an appeal to the industrial gas men of the industry for continued cooperation on industrial gas utilization problems. As pointed out before, no outside, well-financed organizations are available to study and solve our utilization problems. Each member of the "Industrial Gas Fraternity," so to speak, must contribute his individual experiences, discoveries, and improvements. The Association itself, or the Industrial Gas Section cannot alone be expected to advance the technique of industrial utilization. That their efforts can be no greater in the aggregate than the sum of individual contributions, is obvious.

Fortunately for the gas industry, there has always existed an excellent spirit of cooperation among the industrial men. What is more rare than to have an industrial gas man who is not willing to disclose the facts about an improvement in an industrial gas application, which he has developed? We might properly ask how else the technique of industrial gas application could have advanced so rapidly during the past ten years since the first book of the "Industrial Gas Series" was published.

It almost goes without saying that the future progress of industrial gas technique depends upon this willingness of industrial men everywhere to contribute their bit. The industrial gas men must help themselves or they may not be helped.

Gas Exhibit at Plumbers' Meeting

The National Association of Master Plumbers will hold its fifty-second annual convention in Washington, D. C., May 28-31. The American Gas Association with the cooperation of the Washington Gas Light Company, the Consolidated Gas Electric Light & Power Company of Baltimore, and other gas companies in the vicinity of the District of Columbia, will exhibit at this convention in the interests of promoting closer relationship with the plumbing industry.

The first exhibit of this kind was made at the fiftieth or golden anniversary held in New York in 1932, followed by an exhibit at the convention in 1933, held in New Orleans. On each of these occasions the gas companies in the vicinity of New York and New Orleans cooperated.

The Association has learned that a number of manufacturers of gas appliances have already applied for space and these, together with the gas industry exhibit, should have a most helpful effect in strengthening the relationships between the plumbing and gas industries.

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* Brought up to date by Nos. 7 and 12.

Gas Industry Displays at Heating and Ventilating Exhibition

By J. A. Malone

Chairman, Display and Contact Committee
Industrial Gas Section

THE Third International Heating and Ventilating Exposition, held at Grand Central Palace, New York, February 5th to 9th, presented a new opportunity to tell the story of gas comfort in the home.

This annual heating and ventilating exhibit is under the auspices of the American Society of Heating and Ventilating Engineers. A fully representative display of equipment was shown, including, in the heating group, gas, oil, coal and electric units. The exhibits were, in general, grouped as follows:

Combustion, Hydraulics, Steam Heating, Warm Air, Air Conditioning, Refrigeration, Structural Insulation, Controls, Auxiliaries.

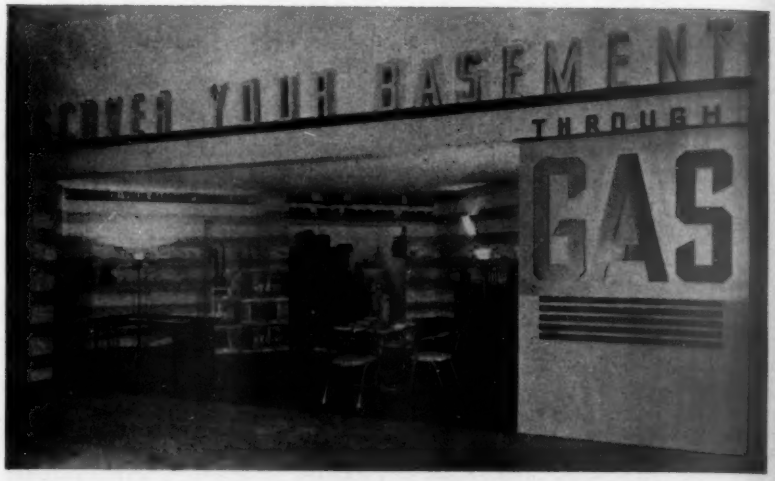
In this display of competing interests, the gas industry occupied several well located booths, including an educational exhibit arranged for by the co-operation of the American Gas Association, The Brooklyn Union Gas Company, the Brooklyn Borough Gas Company, the Consolidated Gas Company of New York and the New York and Richmond Gas Company. This booth also served as a headquarters point and was so used by all those interested in gas.

The various representative manufacturers of gas equipment had their own individual booth areas, with an excellent display of their equipment. The companies so represented were:

Air Controls, Inc., American Radiator Co., American Gas Products Co., Bryant Heater & Manufacturing Co., Fox Furnace Co., General Gas Light Co., L. J. Mueller Furnace Co.

Many of the displays of auxiliary equipment included accessories used in connection with gas house heating installations. A display of structural insulation adaptable to new or existing houses was of considerable interest to the gas industry, architects, builders and other visitors.

Air Controls, Inc. showed some of the new fan units suitable to warm air installations. American Radiator Co. displayed some items in their general line. American Gas Products Co. had a full display of their gas house heating equipment. Bryant Heater and Manufacturing Co. showed their regular gas house heating units, and in addition, new winter air conditioning equipment, a new summer dehumidifying unit, and a recently developed automatically controlled humidifier for winter use. Fox Furnace Co. displayed a large air conditioning unit. General Gas Light Co. exhibited unit heaters, including a recent floor type warm air heater. L. J. Mueller Furnace Co. showed their line of gas house heating equipment.



Two of many attractive Gas Displays at International Heating and Ventilating Exposition, New York

The co-operative gas industry booth was laid out as a model up-to-the-minute basement in a gas house-heated home. This room was fitted out as an adult recreation room, with pool table, card table and athletic equipment. The theme of the exhibit was—"Discover Your Basement—Through Gas." The wall areas were strikingly brought out by means of an unusually attractive wall paper. Indirect lighting was used to give an even and pleasing illumination.

The gas equipment in this booth was shown as it would be installed in such a home. Included was a warm air conditioning unit, an automatic storage water heater and a radiant fire-place heater.

This display was developed and executed under the direction of R. M. Martin, director of displays, Consolidated Gas Company of New York.

As an index of the trend in modern heating, it was noted that a great number of visitors expressed special interest in air conditioning equipment, mainly from the standpoint of winter air conditioning, with some inquiries on summer air conditioning.

Educational literature on the part played by gas in attaining modern comfort in the home was distributed in the headquarters booth. This included catalogs and booklets of the various displaying manufacturers, also a general booklet entitled "Discover Your Basement," this heading tying in with the caption used in large lettering for the entire display itself.

TESTING LABORATORY

R. M. CONNER, Director Managing Committee: J. S. DeHART, Jr., Chairman N. T. SELLMAN, Secretary

Studying Basic Relationships of High Temperature Industrial Gas Combustion

Spectral-line-reversal apparatus

ACTIVE research is being conducted at the Testing Laboratory to reveal certain unknown fundamental laws and factors influencing the high temperature combustion of gas for industrial purposes. This work has been pursued under the direction of the Committee on Industrial Gas Research for over two years, and has already resulted in the publication among others of a bulletin on "Research in Fundamentals of Combustion Space Requirements in High Temperature Gas Furnaces."

The current extension of that work is being directed towards studies of the effects of operating temperature and furnace pressure upon the combustion space requirements of industrial gas furnaces. Interesting tests on similar water-wall and refractory-wall furnaces to date point to the probability that wall temperature has little, if any, effect upon the amount of gas that can be completely burned in a given chamber.

In the photograph herewith is shown, in use, in addition to several test combustion chambers, the Spectral-line-reversal apparatus for measuring high flue gas temperatures, the A. G. A. high velocity thermocouple, an Iodine-Pentoxide apparatus for precise CO detection and measurement, a complete gas analysis apparatus, and the A. G. A. water-cooled sampling tube for obtaining true combustion samples in reaction zones. All of these pieces of apparatus are playing important parts in the series of high temperature combustion projects.

Recovery Capacity of All Approved Gas Water Heaters To Be Increased

THE recovery capacity or output of a water heater is a function of its input rating and efficiency. For storage and circulating tank gas water heaters, this is usually specified in gallons per hour. On account of the higher input ratings and greater capacity of multicoil and instantaneous type heaters, however, their recovery capacities are generally given in gallons per minute. Under the current water heater specifications which became effective September 1, 1931, the recovery capacity of gas water heaters is defined as follows: amount of water in U. S. or Imperial gallons raised 60 degrees Fahrenheit per hour or per minute when calculated on a thermal efficiency of 65 per cent, representing the water heated by a gas input of 770 B.t.u. per U. S. gallon or 924.3 per Imperial gallon."

The current requirements also specify that the recovery capacity must be shown on the name plate of every approved heater.

Recovery capacities for all approved gas water heaters, based upon the above definition, are shown in the A. G. A. List of Approved Gas Appliances.

The new American Standard Approval Requirements for Gas Water Heaters which become effective July 1, 1934, specify that the recovery capacity of water heaters shall be based on a thermal efficiency of 70 per cent, the revised definition reading as follows: "The amount of water in U. S. or Imperial gallons raised 60 degrees Fahrenheit per hour or per minute when calculated on a thermal efficiency of 70 per cent, representing the water heated by a gas input of 715 B.t.u. per U. S. gallon or 858.2 per Imperial gallon."

Furthermore, the name plate on circulating tank gas water heaters need not show the recovery capacity under the new standards effective July 1st.

In view of the above revisions in the water heater requirements, manufacturers of approved appliances of this type should show the revised recovery capacities on their water heater on and after July 1, 1934. Until that time, however, the recovery capacities shown on name plates should remain as at present.

The July 1, 1934, List of Approved Gas Appliances will show the revised recovery capacities of all approved water heaters based upon the new definition.

A notice relating to the above matter was mailed to each manufacturer of approved gas water heaters in January. Attention is again called to this subject, however, so that manufacturers may take these facts into consideration when re-ordering a supply of name plates.

If further information is desired concerning this matter, communications should be addressed to R. M. Conner, Director, A. G. A. Testing Laboratory, 1032 East 62nd Street, Cleveland, Ohio.

Research on Test Gases

EXTENSIVE investigations concerning the desirability of various possible test gases for use in A. G. A. appliance approval testing operations have just been completed at the Cleveland Laboratory. This work was done for and at the request of the Approval Requirements Committee of the American Gas Association to which a complete report covering all findings will shortly be submitted.

In conducting this work the Laboratory has constantly been mindful of the fact that the most appropriate series of gases for testing domestic equipment should (1) represent as completely as possible the wide variety of city gases served to customers throughout the country, and (2) afford for each type of approval test to be conducted on each type of appliance at least one gas which represents a practical extreme of severity. The three test gases which are at present in use seem, in the light of investigation on the above basis, to have been generally well selected. However, develop-

(Continued on page 142)

TECHNICAL SECTION

O. S. HAGERMAN, Chairman H. W. HARTMAN, Secretary C. A. HARRISON, Vice-Chairman

Electrolytic Method for Determining Condition of Non-Metallic Pipe Coating*

By Scott P. Ewing
and
Gordon N. Scott

Abstract

THE so-called Pattern Test for protective coatings on underground pipe lines, which depends upon the precipitation of ferrous (ferric) ion by ferricyanide (ferrocyanide) ion, has been studied to determine the importance of the various factors which influence the density of the pattern. The metallic ions are produced by electrolyzing the iron and are received on a suitable pattern paper. The paper carrying the ions is immersed in a developing solution. The blue stains which may be produced record the discontinuities in the coating. The results of the investigation have been summarized in a recommended procedure for performing the test.

I. *Introduction*

Until recently there have been no generally used methods of testing protective coatings on underground pipes. Certainly there have been no standardized methods of procedures whereby comparable results could be obtained by different observers. Among the suggested and recently used methods the so-called "pattern test" has given promise of being one of the most practicable tools for use in connection with inspections of coatings which have been exposed to soil conditions but its possibilities have not been completely utilized since the conditions under which the tests have been made have not been strictly comparable. Since the patterns produced by the development of stains on a suitable receiving medium give essentially a picture of the magnitude of pinholes, holidays, ruptures, or other discontinuities in the coating and fixes their relative positions with respect to each other, the patterns obtained constitute valuable records which later may be studied or compared one with another.

The various patterns may be compared either with respect to the quantity distribution of the stains or the intensity of color but since the intensity and consequently in some cases the appearance of the stains themselves depends upon how the test is conducted, a study of the factors affecting the test seemed advisable. Such a study seemed especially desirable since both authors have recognized marked differences in the results of the tests as previously made in the field. Furthermore since the measurement of the electrical conductance of non-metallic pipe coatings[1] has been described in some detail by E. R. Shepard and since there is available a systematic method[2] for the visual inspection of protective coatings on buried pipe, a recommended procedure for making the pattern test would complete for investigators descriptions of the best methods available at present for examining coatings.

The use of high voltage to detect flaws in a hot bituminous coating has been shown by Clarvoe[3] to be a valuable and reasonably reliable method. It has the great advantage that the coated pipe can be tested about as fast as a man can walk. The pattern test is obviously much slower. High voltage will probably not prove reliable for inspecting coatings after they have been buried since all bituminous coatings absorb more or less moisture and do not have the extremely high resistance of freshly applied hot coatings. Hence both the high voltage and the pattern test are useful, the one for inspecting new coatings and the other for testing coatings after they have been exposed to the soil.

The visual inspection code referred to above is designed to give detailed information on the behavior of the components of a protective coating as well as the condition of the underlying pipe. The latter information is the more valuable from the point of view of the protective effect of the coating. Because of the desirability of conforming to an established practice, it is recommended that investigators use the code. That section of the code defining the letter symbols indicating the condition of the pipe is presented herewith:

"IV—CONDITION OF PIPE

a. No new corrosion (pipe in precoated condition).

b. Definite surface rust (both A and N).

c. Shallow metal attack (N).

d. Pitted (N).

e. Depth of deepest pit in mils in the area inspected.

"*Definite surface rust.*—An unmistakable accumulation of corrosion products has occurred since the coating was applied (1) which may be scraped in appreciable quantities from the pipe surface with a knife blade and (2) under which the roughening, if any, shall not have progressed to such an extent that the point of a knife will catch in the edges. This definition specifically excludes stains or mere discolorations on the surface of the pipe.

Shallow metal attack.—Where the *definite surface rusting* has progressed to the point of definitely roughening the pipe surface. This shall be determined by scraping the rusted surface with a knife blade. The roughening can be detected by the knife blade catching in the etched or corroded surfaces.

Pitted.—Where the metal attack has been measured and found to be ten mils (0.01") in depth or over. The limit of error even with careful measurement may be as high as two mils. This fact is stated as an integral part of this definition."

The letters, A and N, in parenthesis, dictate the mode of quantitatively estimating the extent of the effect described. The extent of the effect is indicated by the figures 1, 2, and 3. Their use is explained in the following excerpt from the code:

Numerical subscripts.—In general the numerical subscripts have the following significance: (1) slight, (2) moderate, (3) extensive. Specifically, they are defined by the following table:

Numerical Subscript	*N Average No. Per Sq.Ft.*	*A Average Area Per Sq.Ft.*
1	1 or less	10 sq.in. or less
2	Greater than 1 but not greater than 3	Greater than 10 sq.in. but not greater than 50 sq.in.
3	Greater than 3	Greater than 50 sq.in.

The application of the code dealing with the condition of the pipe will be clear after a little study of the excerpts given above. Both authors have used this part of the code in their coating investigations and have found it satisfactory.

* Paper submitted before Tenth Annual A. G. A. Distribution Conference, Pittsburgh, Pa., April, 1933. Publication Approved by the Acting Director of the Bureau of Standards at the United States Department of Commerce.

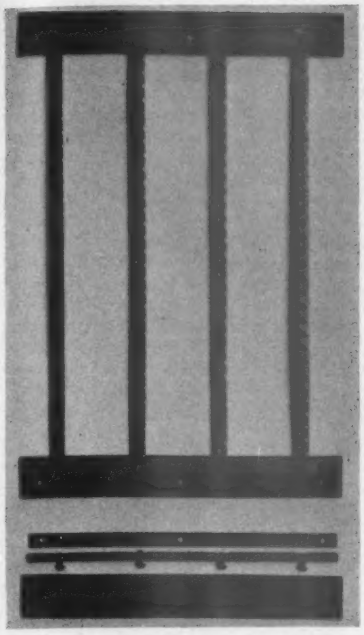


Figure 1
Saddle used to make contact with flannel pad

II. *The Pattern Test*

The idea of making a permanent record of the discontinuities in a protective coating is not especially new. Pitschner[4] appears to have been the first to have used paper in connection with the well-known Ferroxyl Test [5, 6] to obtain a permanent record of discontinuities in metallic protective coatings. Pitschner's modified ferroxyl test depends upon the fact that if any corrosive medium, e.g., a salt solution, is present together with ferricyanide ions in contact with iron and a metal cathodic to iron such as nickel or copper, corrosion of the iron will occur, and a blue color will be produced upon a paper previously coated with agar-agar containing ferricyanide and sodium chloride. Cournot,[7] dispensing with the agar-agar coated paper, merely moistened filter paper with a solution of $K_3Fe(CN)_6$ and alkali chloride and applied it to the surface to be tested. Defects in the metallic coating produced colored stains depending upon the metal to which the coating was applied.

Walker and Hickson[8] in attempting to apply Pitschner's improved ferroxyl test for electroplated coatings to paints, found that the "ferroxyl" reagent was repelled by the coating. They found, however, that by using a dry cell and passing a current from the panel as anode to a cathode through a sheet of unsized bond or filter paper moistened with a weak solution of sodium chloride containing a few drops of phenolphthalein, an intense red color (due to the action of the accumulated hydroxide ions on the indicator) appeared wherever a pinhole or bare metal was present.

Ewing found the Walker-Hickson test even with the application of a very high voltage, entirely useless for locating pinholes in thick organic coatings because contact of the paper with the exposed metal is obviously impossible and the filter paper appeared to draw water from capillaries, thus destroying the electrical contact with the coated metal. To overcome these difficulties Ewing[9] resorted to the use of a water and clay mixture, containing an alkali ferricyanide, which was painted on the coated specimen. The clay was forced into the small holes in the coating by placing the clay coated specimen in an air tight cylinder which was then evacuated. After breaking the vacuum the specimen was removed and placed in a tank containing a weak salt solution and the pipe was made anodic to a copper plate in the tank with an 18-volt battery for a period of two minutes. The blue spots, which appeared on the white clay on the pipe, located the discontinuities in the coating. A permanent record of the discontinuities was obtained by making a panoramic photograph of the clay coated specimen.

Scott[10] adapted Ewing's procedure to field tests by dispensing with the evacuation and using a tough absorbent paper to receive the blue stains. Briefly, Scott's procedure was to paint the coated pipe with a layer of mud, tightly wrap the absorbent paper over the mud, cover the paper with outing flannel saturated with a salt solution and bind the entire set-up to the pipe with a suitable metallic saddle[1] which was used as an electrod. (Figure 1.) A 22½ volt B-battery served to pass an electrolyzing current from the pipe as anode through discontinuities in the coating, the mud and pad to the saddle for six minutes. The paper was then stripped from the coated pipe and immersed in a weak potassium ferricyanide solution, which produced blue stains on the pattern paper corresponding to discontinuities in the coating. The paper was then washed and dried. Figures 2 and 3 show the application of the test to a coating on a pipe line.

III. *Factors Affecting Pattern Test*

The general procedure employed in this investigation was to make a series of tests changing one factor, which might possibly affect the pattern density, while all others were maintained constant. The effect of the various factors on the coating

Figure 3
Close-up view of saddle in use

Figure 2
Arrangement of field equipment for making pattern and conductance tests

conductance was also observed. The patterns were arranged in order of increasing density by visual inspection. Ordinarily four observers would arrange the patterns independently. The average order of these measurements was computed and compared with the associated changes in the affecting factor. If the affecting factor had a marked effect on the pattern density the agreement of the independent arrangements was excellent. If the affecting factor had little or no influence on the pattern density the arrangements of the patterns by the different observers differed widely. This procedure of rating the pattern density proved very satisfactory.

In the following paragraphs are discussed the various factors studied.

(a) *Developing Solution*

It was found that both potassium ferricyanide and ferrocyanide could be used equally well to "develop" the blue stains on the pattern paper, but a mixture of the two appeared to give slightly better results. However, the advantage of the combination is not sufficiently definite to recommend its use.

(b) *Electrolyzing Current*

There is a very definite increase in pattern density with the time of application of the potential. Keeping the potential constant at ten volts, the times were varied from five seconds to twelve minutes. It was found for the particular coating used that the pattern density at ten volts and fifteen seconds was most sensitive to recognizable changes in density. Accordingly pattern densities were compared for the effect of the applied potential by maintaining the product of the potential and time constant and equal to the 120 volt seconds. If this product is maintained constant there was

found little difference in the pattern densities when potentials from 2 to 30 volts were used.

Repeated tests at 10 volts for 15 seconds on a "dry" coating proved that the pattern density increased with each successive test for the first few tests. Repeated tests on a dry coating result in a gradual soaking or adjustment of the moisture in the coating until it becomes very sensitive to the application of moderately low voltages for short periods. Although the previous tests would indicate a small product of voltage and time would be sufficient to produce distinct patterns it should be remembered that a product, at which the pattern density was susceptible to marked changes by variations in affecting factors, was selected for test purposes. For best results, in the field, a larger product will be required than these tests indicate.

(c) *Pad Solution*

In the previous descriptions of the pattern test,[10] it has been recommended that an outing flannel pad soaked with a 10 per cent salt solution (resistivity about 10 ohm-cm) be used to serve as a conducting medium between the paper and the saddle electrode. It was noticed in the field that this practice made the measurement of the conductance of a coating quite difficult at some sites since the conductance gradually increased with time. One reason for this gradual increase appears to be the diffusion of the highly conducting salt water into the poorly conducting clay next to the pipe. A further explanation is that "dry" coatings may require some time to become thoroughly moistened. In this series of tests no appreciable difference was observed in the conductance of the coating as the resistivity of the pad solution was changed since the time of each test was so short that no diffusion of salt into the clay occurred. However, using a 70 ohm-cm salt solution, an increase of conductance from 4000 to 7000 micromhos was observed when a setup was allowed to stand 15 minutes.

It was found, however, that there was a marked increase in pattern density and sharpness of the pattern as the resistivity of the pad solution was increased from 100 to 7000 ohm-cm.

(d) *Variations in "Clay"*

Since the ease with which the clay may be applied to the coating and brushed into irregularities depends upon the consistency or amount of water in the clay, this factor was studied for two pad solutions of widely different resistivities. When the resistivity of the clay was 700 ohm-cm and pad solution 70 ohm-cm, the intensity of the pattern and the coating conductance increased as the amount of water in the clay increased. However, when tap water having a resistivity of 5000 ohm-cm and clay having a resistivity of 1500 ohm-cm was used no appreciable effect was observed on the pattern density or on the conductance excepting that a very dry clay makes complete contact over the coating difficult and tends to blur the pattern. Hence it is important to use a wet clay and to have the resistivities of the clay and the pad solution about the same and relatively high (not less than 1000 ohm-cm).

Changes in the resistivity of the clay from 60 to 2500 ohm-cm indicated no change in pattern density. The measured conductance of the coating, however, increased with an increase in the conductance of the clay from 1400 to 6100 micromhos.

Changes in the pH (hydrogen ion concentration) of the wet clay from 4.3 to 9.0 showed that the clay when acid gave somewhat sharper and denser patterns than did the clay when basic. These findings were confirmed in a later experiment where higher acidity and alkalinity gave more marked differences in density.

The most important single factor affecting the pattern density is the type of "clay" used. The patterns of greatest density are obtained with "clays" composed of relatively coarse particles. As the fineness or colloidal content of the clay increases the pattern density diminishes. These results are indicated in Table 1. Marshall silt loam is a black soil containing considerable organic matter, Miller clay is a very heavy highly colloidal clay, while English ball clay contains little colloidal material, and quartz flour and kaolin contain practically none.

Table 1 also illustrates a specific case of the rating of the patterns by different observers. The first three columns of Figure 1 give the order of increasing pattern density for Experiments Nos. 1 to 8 inclusive as arranged by three observers. The "average" order is given in column 4, while in column 5 the conditions of the tests are briefly indicated.

TABLE 1

EFFECT OF TYPE OF CLAY ON PATTERN DENSITY

(Arrangements of pattern numbers in order of increasing pattern density.)

Observer			Average Order of all Observers	Test	
I	*II*	*III*			
5	8	8	8	Marshall silt loam surface soil—	15 sec.
8	5	5	5	Miller clay	15 sec.
3	3	3	3	Miller clay	15 sec. (check)
6	6	6	6	Miller clay	30 sec.
7	1	7	7	Miller clay	1 min.
1	7	1	1	English ball clay	15 sec.
2	4	4	4	Quartz flour	15 sec.
4	2	2	2	Kaolin	15 sec.

Quartz flour and kaolin gave the patterns of greatest density while the Marshall and Miller soils gave very weak patterns in which the blue stains were faint and confined mostly to the inner face of the pattern paper. The pattern obtained with the use of kaolin and the passage of current for 15 seconds was much more distinct than the one obtained with Miller clay and the passage of current for one minute. The conductance of the clay was in all cases adjusted to the same value.

The weak patterns obtained with the soils is undoubtedly associated with the absorption of the ferrous and the ferric ions. Even with the prolonged passage of the current only a small fraction of the ions actually reach the pattern paper.

A few experiments were made to determine whether or not some simple means could be employed to produce patterns with highly colloidal soils comparable to those produced with kaolin or quartz flour. The addition of a large amount of sodium chloride to the soil increased the pattern density a little. When the soil was acidified with acetic acid until the odor of the acid was noticeable, the pattern paper became blue all over. This effect has been noticed in the field. Strongly acid clays should, therefore, be avoided. The addition of sufficient ammonia until the odor could be detected in the soil quite markedly weakened the pattern density because the ferrous and ferric ions were precipitated as the hydroxide before they reached the paper.

IV. *Recommended Procedure for Making Pattern Test*

The results of this investigation are summarized in the following detailed recommendations for making the pattern test:

1. The clay should be composed of kaolin thoroughly mixed with 1½ times its weight of water, slightly acid to litmus, and its resistivity should be not less than 1000 ohm-cm.

Most tap waters will be found suitable for mixing the clay. If the water used is good to drink, it may be assumed without adjustment or test that the pH and resistivity are within acceptable limits. However, if the paper develops a uniform faint blue stain (acid water) or if the patterns appear to be weak (alkaline water) it may be necessary to adjust the pH of the water with either ammonia or acetic acid (vinegar). The clay should be mixed and used in enameled buckets or stone crocks to prevent contamination from rust. Kaolin may be obtained from dealers in ceramic materials.

2. The developer consists of a 1 per cent solution of potassium ferricyanide (2 tablespoonfuls of the salt per gallon of water) made acid to litmus with acetic acid.

The developer should also be used in stone crocks or enameled buckets.

3. The pad solution consists of ordinary tap water (adjusted as in paragraph 1 if necessary) to which has been added two tablespoonfuls per gallon of the developer described in paragraph 2.

The addition of the developer to the pad solution prevents any ferrous or

ferric ions or rust stains carried to the pad in a previous test from spuriously staining fresh pattern paper. Fresh pad solutions should be made up from time to time. This solution should likewise be used in stone crocks or enameled buckets.

4. One linear foot of the coated pipe surface should be tested.

Field experience indicates that this is a sufficiently large and convenient sample of the coating for the test.

5. The surface of the coating to be tested should be clean and free from adhering soil.

Since the presence of colloidal soils in crevices, craters or other distorted areas tends to prevent patterns of maximum density the coating must be freed of all adhering soil. Vigorous brushing with an ordinary fiber scrub brush and plenty of clean water will remove the most tenaciously adhesive clays and not damage the coating.

6. The clay should be well brushed into the coating on the selected linear foot and smeared on thick enough to cover the entire coating.

Especial care should be exercised to see that the clay is worked into cracks, crevices, air holes or other small discontinuities in the coating.

7. The pattern paper should be wrapped tightly over the moist clay.

The pattern paper should be tough, readily absorptive of moisture and preferably creped, so that it can be stretched where necessary over protruding irregularities in the coating. The moisture absorbing property of the paper may be considered satisfactory if an appreciable current passes through it in 15 seconds when a piece of the paper, laid on a metallic surface and a moist pad about one square inch in area pressed against it, is subjected to the potential of an ordinary dry cell. A "pinhole crepe paper," manufactured by the Perkins Goodwin Co., 551-5th Ave., New York City, satisfies the above requirements. The pattern paper should be twelve inches wide and sufficiently long to wrap around the pipe and lap two to three inches. It is convenient to have the pattern paper in the form of a loose roll. The free edge should be pressed into the moist clay parallel to the axis of the pipe and the paper unrolled around the pipe while one hand smooths the paper pressing it onto the clay. All air pockets should be expelled. If the clay has the proper amount of moisture in it, the pattern paper will soon become moist. The paper should be further moistened and smoothed by folding a wet pad so that a conveniently small flat surface may be used to "iron" the paper. If the pattern is to be used in locating the discontinuities in the coating it should of course be applied to the pipe in a specified manner so that it can be replaced in its original position on the pipe after it has been dried. If the pattern is to serve as a permanent record it may be appropriately marked with an indelible pencil before it is applied to the coating.

8. The pad should then be wrapped tightly over the pattern paper.

The pad, which is 12 inches in width, consists of at least three thicknesses of a heavy grade of outing flannel folded from 36-inch width material. When not in use during the course of a series of tests the pad should be kept in the pad solution.

9. A saddle is then wrapped and tied not too tightly over the pad to serve as an electrode to which electrical contacts may be easily made.

The saddle has been previously described.[1, 9, 10] Copper strips should be used in the saddle assembly.

10. Pad solution is then poured over complete set-up until water starts to drip from the under side of the pad.

11. A potential is applied between the pipe and saddle, the pipe being anodic. The product of the applied potential in volts and the time of application in minutes is approximately, and not less than, sixty.

A radio "B" battery, several dry cells in series or an automobile storage battery will serve as a convenient source of current. Since conductance tests are usually made in conjunction with the pattern tests the conductance of the coating should be measured before the application of the potential.

12. The "set-up" is then taken down, the pad returned to the pad solution and the pattern paper carefully unwrapped and immersed in the developer.

The pattern paper should be carefully immersed in the solution so that no part of the paper touches any other part before it reaches the developing solution. Careful immersion avoids the appearance of spurious stains where no rupture occurs in the coating.

13. The pattern paper should be left in the developer for not less than one minute and should be occasionally agitated after which it should be thoroughly washed in clean water and dried.

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Gas Measurement Course Opens In Oklahoma April 24

THE Southwestern Gas Measurement Short Course for 1934 will be held at the Engineering Building, University of Oklahoma, Norman, Oklahoma, April 24, 25 and 26. This project was established in 1924 at the University of Oklahoma, and offers annually an exceptional opportunity for men engaged or interested in the measurement of natural gas.

The General Committee in charge of this project represents gas producing, transporting and distributing companies, gasoline manufacturing companies, measuring equipment manufacturing companies, the Oklahoma Corporation Commission, the Oklahoma Utilities Association, the Natural Gas Department of the American Gas Association and the Natural Gasoline Association. The course is directed by W. H. Carson, director, School of Natural Gas Engineering, University of Oklahoma.

Attendance at the school embraces employees of all the interests mentioned. Registration in past years has been representative of about twenty-five States and several foreign countries, and attendance at the course this year is expected to be well up toward the records of former years.

The aim and purpose of this gas measurement school is to provide, through the cooperation of the participating interests, means whereby men in the industry may get together to study problems pertaining to the measurement and regulation of dry and casinghead gas. It is hoped thereby to increase accuracy of measurement and efficiency of regulation, to the end that the public may be better served, dealings between buyer and seller put on a more accurate and equitable basis, and that correct information regarding the engineering and practical problems involved be disseminated among the men in the industry.

Seven prizes are awarded each year for papers on the topic "What I Learned at the Meter School." Prizes offered are: First prize, $15; second prize, $10; five prizes, $5 each. Many companies instruct their representatives attending the school to compete for these prizes, which increases interest in and effectiveness of the work done.

The chairman of the General Committee in charge this year is W. R. McLaughlin, of the Arkansas Natural Gas Corporation, Shreveport, La. R. D. Turner of the Skelly Oil Company, Tulsa, Okla., will be in charge of exhibits this year, and D. C. Williams of the Kay County Gas Company, Ponca City, Okla., is chairman of the program committee.

The registration fee for 1934 will be $3, which includes a dinner on one evening at which an enjoyable program is promised.

Monthly Summary of Gas Company Statistics

FOR MONTH OF JANUARY, 1934

Issued March, 1934, by the Statistical Department of the American Gas Association
420 Lexington Avenue, New York, N. Y.

PAUL RYAN, Chief Statistician

COMPARATIVE DATA ON THE MANUFACTURED AND NATURAL GAS INDUSTRY FOR THE MONTH OF JANUARY

	Month of January		
	1934	1933	Per Cent Change
Customers			
Domestic (Including House Heating)	14,584,800	14,475,000	0.8
Industrial and Commercial	757,700	747,700	1.3
Total	15,342,500	15,222,700	0.8
Revenue (Dollars)			
Domestic (Including House Heating)	53,472,300	55,270,500	— 3.3
Industrial and Commercial	16,461,400	15,232,000	8.1
Total	69,933,700	70,502,500	— 0.8

COMPARATIVE DATA ON THE MANUFACTURED GAS INDUSTRY FOR THE MONTH OF JANUARY

Customers			
Domestic	9,320,200	9,315,600	0.1
House Heating	89,300	59,600	49.8
Industrial and Commercial	440,700	434,600	1.4
Miscellaneous	9,200	9,200	—
Total	9,859,400	9,819,000	0.4
Gas Sales (MCF)			
Domestic	21,417,100	21,889,700	— 2.2
House Heating	4,562,200	3,094,000	47.5
Industrial and Commercial	6,945,200	6,166,400	12.6
Miscellaneous	218,600	209,200	—
Total	33,143,100	31,359,300	5.7
Revenue (Dollars)			
Domestic	25,727,000	26,476,800	— 2.8
House Heating	2,894,900	2,178,200	32.9
Industrial and Commercial	5,757,200	5,677,300	1.4
Miscellaneous	148,200	145,300	—
Total	34,527,300	34,477,600	0.1

COMPARATIVE DATA ON THE NATURAL GAS INDUSTRY FOR THE MONTH OF JANUARY

Customers			
Domestic (Including House Heating)	5,175,300	5,099,800	1.5
Commercial	282,100	279,100	1.1
Industrial	23,800	23,100	3.0
Miscellaneous	1,900	1,700	—
Total	5,483,100	5,403,700	1.5
Gas Sales (MCF)			
Domestic (Including House Heating)	39,237,600	42,776,500	— 8.3
Commercial	7,448,200	7,520,200	— 1.0
Industrial	45,632,000	36,384,500	25.4
Miscellaneous	904,000	773,800	—
Total	93,221,800	87,455,000	6.6
Revenue (Dollars)			
Domestic (Including House Heating)	24,850,400	26,615,500	— 6.6
Commercial	3,160,900	3,252,000	— 2.8
Industrial	7,227,200	6,012,400	20.2
Miscellaneous	167,900	145,000	—
Total	35,406,400	36,024,900	— 1.7

Gas Revenues Improve During January

REVENUES of the manufactured and natural gas industry aggregated $69,933,700 in January, 1934, as compared with $70,502,500 in January, 1933, a decline of less than 1 per cent.

Manufactured gas industry reported revenues of $34,527,300 for the month or approximately the same as for the corresponding month a year ago, while revenues of the natural gas industry totalled $35,406,400 or 1.7 per cent less than for January, 1933.

Sales of manufactured gas reported for January amounted to 33,143,100,000 cubic feet, an increase of 5.7 per cent. Natural gas sales for the month were 93,221,800,000 cubic feet, an increase of 6.6 per cent.

As of January 31, 1934, total customers of the industry aggregated 15,342,500, representing a small increase during the twelve-month interval.

Sales of both manufactured and natural gas for domestic uses, such as cooking, water heating, and refrigeration, etc., were still substantially below the figures reported for January, 1933. Sales to industrial-commercial users, however, registered a distinct upturn, manufactured gas companies reporting an increase of nearly 13 per cent in this class of business while for the natural gas companies the gain was more than 25 per cent.

Even larger gains were reported by the manufactured gas companies in sales of gas for house heating purposes which increased nearly 48 per cent from the January, 1933, figures.

To Continue Advertising Campaign on Coast

THE Pacific Coast Gas Association will conduct its sixth consecutive cooperative advertising campaign during 1934, according to an announcement by Clifford Johnstone, managing director.

A 12-months' schedule, consisting mainly of full pages, has been authorized in 20 Pacific Coast trade and business magazines, supplemented by direct-mail and a technical news service.

One of the most consistent cooperative programs on the Coast, this campaign has appeared continuously for 52 consecutive months, and has included, in addition to the industrial division, home-consumer advertising through radio, outdoor posters, magazines and direct-mail.

The campaign is sponsored by the gas utilities of California and the Northwest, and prepared under the direction of a committee of which A. C. Joy, manager, publicity department, Pacific Gas and Electric Co., is chairman for 1934. Other members are D. L. Scott, Los Angeles Gas & Electric Co.; Douglas Buckler, Southern California Gas Co.; J. Earl Jones, Seattle Gas Co.; and Pierre Vinet, Coast Counties Gas & Electric Co.

Wins McCarter Medal

Louis Eaton

LOUIS EATON, of Newburyport, Mass., a lineman employed by the Haverhill Electric Company, Haverhill, Mass., has been awarded a Thomas J. McCarter Medal by the American Gas Association for saving the life of a man overcome by gas through application of the prone pressure method of resuscitation.

The presentation was made at a meeting of the Haverhill Electric Club and Mutual Benefit Association by Dr. E. W. Bullock, supervisor of safety of the company.

Louis Ruthenburg Now Servel President

AXEL WENNER-GREN, chairman of the Board of Servel, Inc., last month announced the election of Louis Ruthenburg, of Detroit, to the presidency of that corporation. H. H. Springford, retiring president, is retained in an advisory capacity on a basis which will leave him free to devote time to other interests.

Mr. Ruthenburg brings to Servel, Inc., experience as a manufacturer and as a leader in trade association activity. He has been prominently identified with the refrigeration industry since early 1929, when he resigned the vice-presidency of the General Motors Truck Company to become president of Copeland Products, Inc. A year later he was elected to the Chairmanship of the Refrigeration Division of National Electrical Manufacturers Association. Since September, 1932, he has served as consultant to the refrigeration industry and has done much to coordinate the industry's operations with the provisions of the National Industrial Recovery Act.

Industrial Publicity

THE Publicity Committee, Industrial Gas Section, the American Gas Association, directs attention to the following articles recently published:

One Fire Sanitary Ware	Ceramic Age — March, 1934
Flexible Gas Firing Follows Load Fluctuations	Power — March, 1934
The Black Art	Manufacturers Record — March, 1934
Heading and Heat Treating Bolts	Heat Treating & Forging — February, 1934
Jobbing Shop for Heat Treating	Iron Age — February 22, 1934
Gas Furnishes Light, Heat and Power in the Building	Building & Building Management — September, 1933
Making Cottonseed Oil, Its Products	Manufacturers Record — February, 1934
Modern Dallas Buildings Heated and Conditioned by Gas	Heating & Ventilating — February, 1934
Pipe from Hot Skelp	Wire & Wire Products — January, 1934
A Molding Unit for Mass Production	Iron Age — January 25, 1934
Gas-Fired Furnaces Used in the Production of Steel Tubing	Fuels & Furnaces — February, 1934
Speeding Vitreous Enameling	Metal Cleaning & Finishing — October, 1933
Millions of Toys	Toys & Novelties — September, 1933
Butt Weld Pipe Plant Arranged to Eliminate Back Tracking	Steel — January 8, 1934
New Flue Construction for Kilns	Fuels & Furnaces — January, 1934
New Flue Construction Insures Uniform Floor Heat	Ceramic Age — November, 1933
Modern Cremation	Embalmers Monthly — October, 1933
Progress of Cremation	Casket & Sunnyside — November 15, 1933
Natural Gas Furnaces in Steel Tube Making	Iron Age — November 23, 1933
Heat Treatment at River Rouge	American Machinist — September 13, 1933
Heating Steel for Bolts and Propellers	Heat Treating & Forging — October, 1933
Forming Aluminum and Brass Products by the Extrusion Method	Machinery — November, 1933
Gas Furnaces in Bolt and Nut Plant	Iron Age — October 19, 1933
How Gas Fuel Has Been Applied at the Tooele Smelter	Mining & Metallurgy — September, 1933
Gas Kilns Have Broadened the Potters' Art	Ceramic Age — September, 1933
Special Furnace Equipment Used for Bolt Production	Steel — September 25, 1933

Exhibit Space at Atlantic City in Heavy Demand

(Continued from page 111)

Standard Gas Equipment Corp.
Electrolux Refrigerator Sales Inc.
Harper Wyman Mfg. Co.
Cruse Kemper Co.
Automatic Products Co.
Pennsylvania Furnace & Iron Co.
International Business Machines Corp.
Addressograph-Multigraph Corp.
Roberts & Mander Stove Co.
The Bartlett Hayward Co.
A-B Stove Co.
Crane Co.
Pittsburgh-Equitable Meter Co.

Canadian Gas Industry Shows Improvement

(Continued from page 124)

more than ever essential and necessary, and many have reached the conclusion that gas fuel, as now applied, together with its ease of automatic regulation, entirely meets this need.

Advances in Air Conditioning and House Heating

One other field that has recently opened up for the greater use of gas, is in that of house heating and air conditioning. In almost every city, boasting an up-to-date gas company or gas commission, the introduction of gas as a home heating and air conditioning fuel is growing apace. Up until but recently gas fuel for house heating purposes was beyond the means of any but the very wealthy, but with the introduction of more efficient equipment, the insulation of homes, and lower gas rates, the possibilities of heating homes with gas has been extended to a very much larger number of gas consumers generally, so that thousands of home owners and builders are now using, or are contemplating the introduction of gas-fired, automatically controlled heating units, throughout the various gas centres of Canada.

Reports have it that there are quite a few cities and towns in Canada not now enjoying a modern gas service, that may, in the not too distant future, have the pleasure of such a service.

Long-distance transmission of gas is also a common practice today. Pipe lines from 100 to 1,000 miles in length are becoming quite the thing in coupling up cities, towns and rural communities with gas service, thus bringing its benefits to many persons otherwise denied the service.

Research on Test Gases

(Continued from page 135)

ments in many major localities that have taken place since the test gases were originally selected suggest certain desirable modifications of the test gas family.

It appears that natural gases such as are now distributed in certain regions of the country, are not fully represented in the existing series of test gases. It is, therefore, recommended by the A. G. A. Testing Laboratory that the use of an additional test gas to cover this situation be authorized. From the standpoint of certain burner flame travel and ignition tests called for by various appliance approval requirements, the addition of such a test gas seems doubly desirable. Its adoption, it is felt, would considerably strengthen existing appliance approval specifications.

In other respects the test gases now utilized by the Laboratory are shown, by both the current study and the results of the extensive mixed gas investigations conducted at the Laboratory some few years ago, to adequately cover the range of gases now distributed. Although it indicates that the 400 B.t.u. water gas, now used in connection with several tests, need not necessarily be retained, the research just completed finds the other test gases used in Laboratory routine to be both necessary and, with the exception of the special natural gas noted above, adequate.

Mid-West Sales Council to Discuss "Forging"

"FORGING" will be the principal subject to be discussed at the next meeting of the Mid-West Industrial Gas Sales Council, which will take place at the Palmer House, Chicago, Ill., May 18. A. F. Mitchell, of the Northern Indiana Public Service Company, will be the principal speaker, who will submit a paper on "Past, Present and Future of Forging."

Pacific Coast Gas Association

PRESIDENT GEORGE P. EGLESTON has announced that the 1934 Convention of the Pacific Coast Gas Association will take place at Hotel Del Monte, Del Monte, Calif., September 11, 12 and 13. It is planned to make this Convention a strictly business meeting devoted to stock-taking and planning for the future.

Oklahoma Utilities Association

(Continued from page 127)

the Public Service Co. of Oklahoma; B. P. Stockwell, Oklahoma City, utility representative of the southern division, Recording & Statistical Corp., New York, Edward B. Downie, general attorney of the Southwestern Bell Telephone Company, Little Rock.; H. S. Bennion, New York, assistant managing director of the Edison Electric Institute; Labert St. Clair, advertising manager of the American Transit Association, New York; Kurwin R. Boyes, secretary of the American Gas Association, New York, and J. F. Owens, Oklahoma City.

R. W. Hendee of Tulsa was re-elected chairman of the gas division, and C. D. Greason, Kansas City, Mo., was again named a member of the gas division and member of the board.

From Oil to Gas

WHILE workmen were engaged in laying a new gas main near Headgate, Colchester, they discovered a Roman oil lamp of the first century.

—*London Times.*

PERSONNEL SERVICE REPORTS CONTINUED ACTIVITY IN CONFIDENTIAL CLASSIFICATION RECORDS

From the writer of letter of February 13th quoted last month an additional communication has been received: ***"I am returning the three personnel records which I retained pending interviews. I wish to thank you very much for your extremely valuable service and consideration. Although my selection was not made from among your files, I am very definitely interested in Mr. ——— to fit into a plan which I hope matures at some early date."***

The President of another organization wrote February 28th asking for a list of ***"likely men from whom we can choose one to appoint as manager of the——— Gas Company."*** Our compliance with this request was acknowledged as follows March 15th: ***"I am returning herewith personnel file which you forwarded on the first. We have made copy of several of these and will write them and if we secure the services of any of these men, we will be glad to inform you so that you can keep your records straight. Thanking you for your cooperation in this matter."***

Lists of salesmen for N. Y. Metropolitan area, compiled from confidential classification records, were mailed March 8th, 9th and 17th in response to requests telephoned from three different organizations.

Associations Affiliated with A. G. A.

Canadian Gas Association
Pres.—Donald G. Munroe, Montreal Coke & Mfg. Co., Montreal, Que.
Sec.-Tr.—G. W. Allen, 21 Astley Avenue, Toronto.

Empire State Gas and Electric Association
Pres.—Alfred H. Schoellkopf, Niagara Hudson Power Corp., Buffalo, N. Y.
Chairman, Gas Section—A. M. Beebee, Rochester Gas & Electric Corp., Rochester, N. Y.
Sec.—C. H. B. Chapin, Grand Central Terminal, New York, N. Y.

Illinois Public Utilities Association
Pres.—Bernard J. Mullaney, The Peoples Gas Light & Coke Company, Chicago, Ill.
Sec.—J. R. Blackhall, Suite 1213, 79 West Monroe St., Chicago, Ill.

Indiana Gas Association
Pres.—R. S. Brunner, Indiana Gas Utilities Co., Richmond, Ind.
Sec.-Tr.—P. A. McLeod, New Castle, Ind.

Michigan Gas Association
Pres.—Walter E. White, Commonwealth & Southern Corp., Jackson, Mich.
Sec.-Tr.—A. G. Schroeder, Grand Rapids Gas Light Co., Grand Rapids, Mich.

Maryland Utilities Association
Pres.—F. A. Mitchell, Eastern Shore Public Service Co., Salisbury, Md.
Sec.—D. E. Kinnear, 803 Court Square Bldg., Baltimore, Md.

Mid-West Gas Association
Pres.—R. L. Klar, Des Moines Gas Co., Des Moines, Iowa.
Sec.-Tr.—Roy B. Searing, Sioux City Gas & Electric Co., Sioux City, Iowa.

Missouri Association of Public Utilities
Pres.—Fred Karr, St. Joseph Gas Co., St. Joseph, Mo.
Sec.-Tr.—N. R. Beagle, Missouri Power & Light Co., Jefferson City, Mo.
Asst. Sec.—Jesse Blythe, 103 West High St., Jefferson City, Mo.

New England Gas Association
Pres.—F. M. Goodwin, Boston Consolidated Gas Co., Boston, Mass.

Exec. Sec.—Clark Belden, 41 Mt. Vernon St., Boston, Mass.

Chairman, Operating Div.—P. R. Buchanan, Hartford Gas Co., Hartford, Conn.

Sec.-Tr., Operating Div.—D. R. Campbell, Portland Gas Light Co., Portland, Me.

Chairman, Sales Div.—H. B. Hall, Old Colony Gas Co., East Braintree, Mass.

Sec.-Tr., Sales Div.—R. J. Rutherford, Cambridge Gas Light Co., Cambridge, Mass.

Chairman, Industrial Div.—P. A. Nelles, Charles H. Tenney & Co., Boston, Mass.

Sec.-Tr., Industrial Div.—S. F. Morgan, New Bedford Gas & Edison Lt. Co., New Bedford, Mass.

Chairman, Accounting Div.—Leland Balch, Lowell Gas Light Co., Lowell, Mass.

Sec.-Tr., Accounting Div.—C. D. Perkins, Malden & Melrose Gas Light Co., Malden, Mass.

Chairman, Manufacturers Div.—C. H. Cummings, Industrial Appliance Co. of N. E., Boston, Mass.

Sec.-Tr., Manufacturers Div.—J. H. McPherson, James B. Clow & Sons, Boston, Mass.

New Jersey Gas Association
Pres.—F. A. Lydecker, Public Service Electric and Gas Co., Newark, N. J.

Sec.-Tr.—G. B. Webber, Public Service Electric and Gas Co., Newark, N. J.

Ohio Gas and Oil Men's Association
Pres.—L. K. Langdon, Union Gas & Electric Co., Cincinnati, Ohio.
Sec.-Tr.—Wm. H. Thompson, 811 First National Bank Bldg., Columbus, Ohio.

Oklahoma Utilities Association
Pres.—H. B. Cobban, Northeast Oklahoma Railroad Co., Miami, Okla.
Mgr.—E. F. McKay, 1020 Petroleum Bldg., Oklahoma City, Okla.

Pacific Coast Gas Association
Pres.—Geo. P. Egleston, H. R. Basford Co., San Francisco, Calif.
Mang. Dir.—Clifford Johnstone, 447 Sutter St., San Francisco, Calif.

Pennsylvania Gas Association
Pres.—A. J. Llewellyn, Luzerne County Gas & Electric Corp., Luzerne, Pa.
Sec.—Frank W. Lesley, Pennsylvania Gas & Electric Co., York, Pa.

Pennsylvania Natural Gas Men's Association
Pres.—F. F. Schauer, Equitable Gas Co., Pittsburgh, Pa.
Sec.-Tr.—B. H. Smyers, Jr., 435 Sixth Ave., Pittsburgh, Pa.

Southern Gas Association
Pres.—B. B. Ferguson, Portsmouth Gas Co., Portsmouth, Va.
Sec.-Tr.—S. L. Drumm, New Orleans Public Service Inc., New Orleans, La.

The Public Utilities Association of Virginia
Pres.—T. Justin Moore, Va. Elec. & Power Co., Richmond, Va.

Wisconsin Utilities Association
Pres.—R. G. Walter, Wisconsin Power & Light Co., Madison, Wis.
Exec. Sec.—J. N. Cadby, 135 West Wells St., Milwaukee, Wis.

16th Annual Convention and Exhibition
American Gas Association
◆
Atlantic City, N. J.
Week of
October 29, 1934

Personnel Service

SERVICES OFFERED

Executive—Not "Jack-of-all-trades"—but one having thorough training, broad experience as Secretary, Treasurer, General Manager, Sales-Advertising-Publicity Manager, Security Sales Director, Cost Analyst, Rate-Valuation Engineer, Industrial Power-Gas Engineer, and otherwise highly developed all phases public utility work; successful record; invaluable contacts. **830.**

Executive-engineer (41) N. Y. State Engineer license, member A. S. M. E. Available for investigations, reports, rate studies, valuations, promotional work, organization of construction and operating forces or general executive assignment. Many years' successful utility experience with both independent and syndicate properties. **834.**

Engineer, broad experience, industrial design, consulting, supervising, executive, plant construction, development product, air and gas compressors, gas engines, design, development, application, sales, automatic gas-fired forced air equipment, services open by the case or definite connection considered. **835.**

Sales engineer capable of managing house heating department in all its branches, covering surveys, installation, estimates, sales promotion, service, repairs and maintenance. Experience also covers industrial field with regard to high and low pressure boilers and large volume water heating. Broad general and technical experience. **836.**

Graduate **gas engineer** (29) with five years' experience in engineering, development and operation of carburetted water gas and coal gas plants, gas transmission and high and low pressure distribution systems; market studies, rates and valuations. Trained for and experienced in utility management. **837.**

Accounting, cost-general, eight years' experience as cost accountant compiling cost data covering utility operations and construction, such as: gas plants, booster stations, manufactured and natural gas transmission and distribution systems. Have audited field office records (payrolls, petty cash funds and material accounts) and compiled special accounting—statistical reports. **838.**

Gas engineer, B. S. in Chem. Eng.; five years rounded experience in U. S. and abroad. Practical and technical experience in plant, distribution, office, construction and survey. Desire executive position with small company. Will go anywhere. Married (29). **839.**

Technical manager, superintendent or engineer, with broad experience of twenty years, covering manufactured gas, natural gas transmission, reforming, blending, change-over, high and low pressure distribution and lay-out. Familiar with brushing up sluggish activity or run down properties of holding company. Sales service and utilization; aggressive. **840.**

Measurement and distribution engineer, speaks Spanish, nine years' design, installation and operation high and low-pressure transportation and distribution natural gas. Now employed in modern coal and water gas production. Specialist in reorganization of meter department and reduction of unaccounted for gas. Prefer Southern-western states or foreign country. Married. **841.**

Advertising or assistant **advertising manager** who has had first hand experience in manufacturing, marketing and advertising: can advertise technical subjects to laymen and technicians, has the ability to work with people, and is a hard worker. **842.**

Young, energetic, technical graduate (B. S. and M. S. in Mech. Engr.) with four years of varied experience with **natural gas** properties: married (29). **843.**

General **manager-engineer** (37) thoroughly experienced in natural gas business from organization, financing, design and construction to production, transmission, distribution, load building and accounting; wholesale and retail, domestic or industrial. Just completed special services in connection liquidation and reorganization of two properties. **844.**

SERVICES OFFERED

Interested in securing popular priced line of console, table top **ranges** and **cookers**. Territory, New York, Pennsylvania and New Jersey including metropolitan New York and Philadelphia. Interested in substantial connection with A-1 manufacturer. **845.**

Experienced **sales manager** with gas appliance manufacturers dealing with utilities or large department stores and furniture trade. Qualified to manage sales department or cover good territory in which there is an opportunity to produce. **846.**

Manager with experience in manufactured and natural gas and electricity with an excellent record of constantly increasing revenue. Particularly qualified in electric competition and have met it successfully and uniquely. **847.**

Sales-gas-engineer desires utility operating connection or as manufacturers' sales representative; regular engineer, twenty years' diversified experience, familiar with design, construction and operation of all gas equipment including holders from drafting board to erection; knows their maintenance and operation thoroughly. Exceptional sales record and unusually fine contacts with executives. **849.**

Domestic **coke service** man (35) technically trained. Thoroughly experienced in burning coke in small and medium sized furnaces, background of research and position with one of the largest producers of domestic coke. Capable of handling service and customer contact department. Also experienced in coke production and sales. **850.**

Development and **sales engineer** (M. E.) having eighteen years gas and electric company, as well as large oil burner company, sales experience. Established enviable record in electric and gas industrial sales, central gas heating and air conditioning. **851.**

University man with exceptional practical and technical training and long experience in heavy **industrial** uses of gas, heat utilization, industrial relations, and in the various phrases of sales work, seeks responsible position with large utility, a wholesaler of gas to utilities, combustion engineering concern, or manufacturer. Thoroughly competent in development work. **852.**

Industrial **fuel sales** engineer. Experience gained with eastern utility. College graduate. Member ASME. Qualified make surveys, design burners, piping and auxiliaries. Familiar with all principal metallurgical operations, ceramics, baking, etc. Understands space heating and air conditioning. Age, experience, ability sufficient to take charge of territory or department. Outstanding sales ability. **853.**

Engineering executive with twenty years of unusually broad technical and practical experience in the management, operation, financial and public relations problems of gas companies, and with especial training in rate development, desires either a permanent connection or a temporary opportunity to handle special problems; qualified consultant and expert witness. **854.**

Sales manager. Eighteen years with one utility company plus sales promotion experience with one of the largest gas appliance manufacturers. Outstanding record in merchandising and sales management. Experienced in meeting electric competition. Exceptionally well qualified in building good will. **855.**

University graduate mechanical engineer with vision, initiative, imagination, creative ability and common sense; broad experiences in **management**, sales, markets, contracts and negotiating; **engineering**, plants, equipment, inventions and patents; business cycles, business indexes and economics; and in assembling, arranging and interpreting statistics, data and conditions. **856.**

SERVICES OFFERED

Gas **engineer** and **manager**, university graduate (45), twenty-two years' experience in executive positions, including coal, oven and water gas, natural gas, high and low-pressure distribution. **857.**

Manager-gas engineer (46) married. Technical education, twenty years' experience in construction, engineering, manufacture, distribution, finance, management, sales and public relations; wide experience. Build up property or develop sales per year per customer, small or large property. **858.**

Gas engineer (34) technical graduate, with several years' broad experience with affiliated holding and operating companies in high and low pressure distribution, coal and water gas manufacture, natural and refinery gas, design and installation of distribution and transmission systems; specialist with excellent record of results in mitigation of unaccounted for gas. **859.**

Reduced income of gas companies require better and more intelligent plant control to help maintain dividends. Experienced **gas engineer** can bring to your organization or company that technical and practicable aid necessary to further reduce operating expenses to a minimum. **860.**

Utilization sales engineer (39) with unusually broad experience in employ of gas companies and equipment manufacturers service. Technical graduate and thoroughly well qualified for domestic commercial and industrial sales or research. **861.**

Manufacturers representative with many years experience and with headquarters and staff in New York City, covering Eastern territory, will be glad to entertain proposition to represent another non-competing manufacturer, preferably industrial specialties. **862.**

Sales Executive or salesman desires responsible position. Twelve years with specialty manufacturers in sales promotion work successfully selling on national scale to leading gas companies. Familiar with plumbing and heating appliance trade. Handle advertising. College man in prime, clean record, energetic, eager, resourceful, accustomed to large volume business. Compensation open. **863.**

An honest, steady, well-educated, thoroughly trained gas man desires a connection where his fifteen years of varied experience can be used. He has served in plant and distribution operation, as **district manager**, headed gas department of combination company; understands safety work and has devoted considerable study to rate making. **864.**

POSITIONS OPEN

Foreman or **engineer** wanted for Roumania, expert in erecting and running natural gas channel black plant. Applicants should have had several years' practical experience; please give record and state salary expected. Our technical director will be in the United States in April to get in touch with applicants for personal interview. **0267.**

For large retail store handling ranges, electric refrigerators, gas appliances and hotel kitchen equipment and serving large southern city, a man who knows how to approach the public on both domestic and commercial equipment. Familiar with and knows how to measure homes and stores for central heating, to secure business and has ability to create new **sales** ideas as well as employ competent sales force. Position will pay a reasonable drawing account based against commissions. **0268.**

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